SOUTHERN POWER AND INDUSTRY

OCTOBER, 1952

In This Issue

96 CASE STUDIES

Showing how production is being improved in Southern and Southwestern plants through better planning and improved use of modern equipment.

TEN FEATURE SECTIONS

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Fifth Annual

Better Production

Issue

Fast Motor Service Wherever You Are

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Volume 70 Number 10

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New York City

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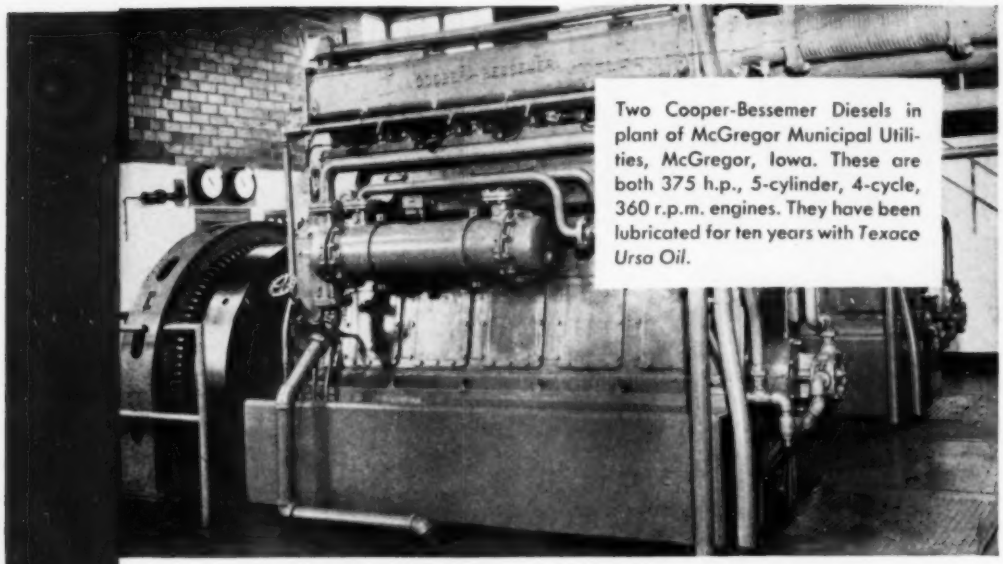

Two Cooper-Bessemer Diesels in plant of McGregor Municipal Utilities, McGregor, Iowa. These are both 375 h.p., 5-cylinder, 4-cycle, 360 r.p.m. engines. They have been lubricated for ten years with Texaco *Ursa Oil*.

"We've used TEXACO URSA OIL for over 10 years and can state that it

KEEPS DIESELS CLEAN ...KEEPS COSTS LOW"

— says Raymond A. Trygg, Superintendent, McGregor (Iowa) Municipal Utilities

Mr. Trygg states further regarding the outstanding performance of *Texaco Ursa Oil:* "When our Diesels were last opened up — for their first inspection in two years—they were found to be clean and there was no measurable wear on pistons, rings, liners or bearings."

Because of the exceptional engine cleanliness assured with *Texaco Ursa Oil,* operators everywhere get longer parts life, lower maintenance costs, less fuel consumption, lube oil economy. Latest annual figures, for example, show that McGregor gets 12,469 h.p. hours per gallon of *Texaco Ursa Oil.*

Whether you're operating Diesel, gas or dual-fuel engines, there is a *Texaco Ursa Oil* that is exactly right for the size and type of your engines, and your particular operating conditions. Leading engine builders approve *Texaco Ursa Oils,* and they are easily America's favorite. In fact —

For over 15 years, more stationary Diesel h.p. in the U.S. has been lubricated with Texaco than with any other brand.

Let a Texaco Lubrication Engineer help you keep your Diesel efficiency high, your costs low. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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FOR ALL DIESEL, GAS AND DUAL-FUEL ENGINES

Faithfully yours 50 *for Fifty Years*

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SOUTHERN POWER AND INDUSTRY

OCTOBER 1952

Vol. 70 No. 10

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CONTENTS—Fifth Annual Better Production Issue

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Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

October, 1952

► BAGASSE BOUNCES BACK -- reports The Journal of Southern Research. Few technical-industrial developments have had so many ups and downs as the possible use of bagasse, sugar cane residue, in paper making. While the idea is not new (reported in New Orleans some 70 years ago), it now seems to be getting a new lease on life.

The present picture is by no means clear. The proposed United Bagasse Cellulose project at Clewiston, Florida, is said to be definitely out. However, recent highly publicized experimental runs at the Herty lab in Savannah have fanned wide interest and raised hopes of adequate financial backing for a big mill in the sugar-producing areas of Cuba. Meanwhile, the Valite Corporation of New Orleans, expresses keen interest in a Louisiana mill.

No one doubts that a commercial grade of paper can be made from bagasse. A plant in Peru has been running for 10 years. The $64 question is whether bagasse newsprint can be produced at attractive prices in this country at the present time. Industrial interest now seems sufficient to provide an answer at an early date.

► IN LOW PRESSURE BOILERS, corrosion is the largest single cause for replacement of boiler tubes. How to avoid boiler tube corrosion is discussed in Bulletin TR-514 available from The Tubular Products Division of The Babcock & Wilcox Company, Alliance, Ohio. Bulletin points out the various types and causes of corrosion and offers a number of general rules to follow to get maximum service life for boiler tubing.

► EXPANDING USE OF ALUMINUM FLOOR GRATINGS is reported by Borden Metal Products Co. of Elizabeth, N. J. and Leeds, Alabama. Ultimate in-place cost is only slightly higher than that of conventional gratings, bringing all the advantages of aluminum to industry.

Installation of aluminum gratings saves approximately 1/2 the weight of an equivalent steel installation. They don't have to be painted and their exclusive non-sparking quality reduces fire hazards in confined areas.

► ALMOST UNNOTICED BY THE GENERAL PUBLIC, the chemical processing industries have forged into the lead as the South's largest and most profitable industrial activity, emphasizes James F. Crist, Vice Pres., The Southern Company and new President of the Southern Association of Science and Industry.

"The chemical industries, including pulp and paper, petroleum chemicals, synthetic fibers, fertilizer, vegetable oils, naval stores, and industrial chemicals, now surpass all other Southern industries, including textiles, in volume of annual sales."

► BELT GRINDING ATTACHMENT for horizontal grinders combines the maneuverability of the portable horizontal grinder with the utility of the abrasive belt. Unit will cut production time and costs on many applications where mounted wheels, cones and hand files have provided only a partial solution to grinding problems. Write Buckeye Tools Corporation, Dayton 1, Ohio, for details.

(Continued on page 6)

Reversing Drum Switch

For a-c and d-c motors *rated 2 hp or less*

Bulletin 350

STYLE A

Compact

Low Cost

The new Bulletin 350 manually operated reversing drum switch provides a reliable unit for applications where space is at a premium and low cost is an all important factor. It is equivalent to a three pole, double throw switch equipped with quick make action. Contacts are cadmium silver alloy, eliminating the need for maintenance.

Bulletin 350 reversing switches are ideal for small workshop tools and for medium duty industrial service. They can be used with d-c motors, or single phase, two phase, or three phase a-c motors, rated two horsepower or less. Send for Bulletin 350.

Allen-Bradley Co., 1328 S. Second St.
Milwaukee 4, Wis.

MOUNTING ARRANGEMENTS

Bulletin 350 drum switch in standard enclosure.

With mounting angle and double conduit opening.

Drum switch mounted on standard square junction box.

With cover plate for cavity mounting in machine base.

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CHARLOTTE—Le Roy P. Spoon, 307 Lincoln St., Tel: 4-6334
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KNOXVILLE—Bowditch & Co., 1311-C N. Broadway, P. O. Box 3145, Tel: 4-2513
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SAN DIEGO—James A. Setchell, 301 W. "G" St., Tel: Franklin 3981
TULSA—John W. Elder, 1341 S. Boston, Tel: 3-0950

facts and trends (continued from page 4)

► NEW EFFICIENCIES IN RAILWAY CAR MOVING, spotting, and switching with the Whiting Corporation Trackmobile are being reported by Southern and Southwestern industrial plants. The Texas Division of the Dow Chemical Company, Freeport, Texas, uses the Trackmobile for intra-plant short movement of tank cars.

The Texas Division is served by a public carrier. However, respotting and other necessary short movement of tank cars had been made by the use of stationary power winches and occasionally by trucks. These methods are time-consuming and hazardous.

As the Whiting Trackmobile can quickly accomplish the movement of cars on the track to properly serve a loading rack and then move quickly over the plant roads to other tracks, these short movements are made efficiently and safely.

► SELF-SETTING CLAMPS for presses and machine tools require no packing. Autoset clamp has a number of transverse slots in the top face and the washer can be moved to accommodate fixed bolt holes so that small bolsters may be secured as readily as larger ones. Offers saving in setting time and solid gripping capacity. Write Alpha Tool & Supply, Westwood, New Jersey, for details.

► SHOP MEN WORKING WITH STAINLESS STEEL recognize the need for a simple, fast and economical method of removing heat discoloration from welded areas. Use of mechanical means is necessary in some instances and adequate in many, but there are other cases, such as inside corners, where a less costly method is desirable.

A handy process developed by the Armco Research Division removes this weld discoloration by electrolytic means at speeds up to 4 ft/min. One terminal from an a-c power source is connected to the work, the other to a suitable electrode. An electrolyte is poured into the welded corner in sufficient quantity to cover the discolored area. Electrode is passed over the discolored area in such a way that it is in contact with the electrolyte but is separated from the surface of the work.

Write the Market Development Div., Armco Steel Corporation, Middletown, Ohio, for a copy of "Electrolytic Removal of Weld Discoloration." Five page bulletin covers basic process, electrolyte, electrodes, power, time, applications, and results.

► FUEL COST CALCULATOR, developed by Bituminous Coal Research, Inc., 2609 First National Bank Bldg., Pittsburgh 22, Penna., is an easy-to-use, completely practical tool for making fuel cost comparisons and for computing coal consumption from boiler outputs. Principal fuels are shown — coal, propane and butane, five common grades of fuel oil, and manufactured and natural gas. List price is 50 cents.

► PERFORMANCE OF ALUMINUM CONDUCTOR CABLE will equal that of copper, if it is handled as recommended by reputable connector suppliers according to Thomas & Betts Company, Elizabeth 1, New Jersey, publisher of a new folder "Making Good With Aluminum." Conductivity, oxide coating, susceptability to mechanical damage, expansion and contraction and electrolytic action are discussed in detail. Data sheets tell you what to do about them when connecting aluminum wire and cable.

► FLEXIBLE VALVE SHIELD designed for use on valves handling acids and other hazardous chemicals, protects the operator from injury if the valve stem packing should fail. The neoprene shield cups the stem and the packing gland and prevents acid from spraying on the operator. The "Chex-Spray" shield can be turned back to inspect the valve or to tighten the packing gland. Write Industrial Products Company, Philadelphia 33, Penna., for details.

Write the editors for additional information on any of the above items.
SOUTHERN POWER & INDUSTRY, 806 Peachtree St., N.E. Atlanta 5, Ga.

LONG LIFE EXPANDERS WITH BUILT-IN FLAKE RESERVOIR

"Franklin"
The World's Finest tube expander

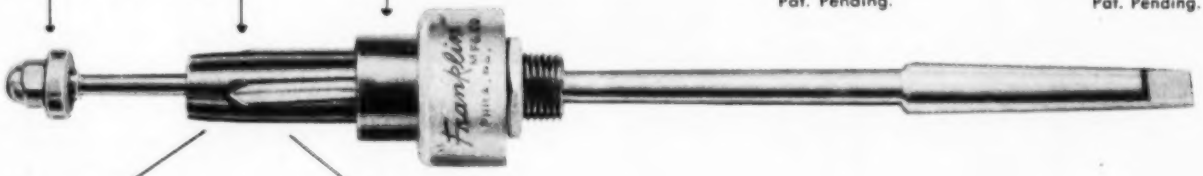
Flake Reservoirs, Self Oiling, Easy To Clean. Pat. No. 2,524,164

Guide Roller Reduces Mandrel Breakage.

DUDLEY KNURLED FLUSH COLLAR or DUDLEY KNURLED RECESS COLLAR

Eliminates Tube Spinning During Rolling. Pat. Pending.

Positions Tube Automatically For Flaring. Pat. Pending.



Reduced Feed Angle. Less Friction. Less Roller "Wrap Around."

● Compare the roller retaining lip of a Franklin Expander to any other and you will SEE why Franklin Expanders last longer.

Meets Navy Specifications

When Ordering Specify Type Collar Desired

NO. 1

DUDLEY "Knurled" Flush Ball Bearing Collar to automatically set tube flush with face of sheet, eliminates spinning of tube during rolling operation. Also, eliminates "pinning" or "pinching" tubes, saving labor. PAT. PENDING — Only FRANKLIN has this feature.

NO. 2

DUDLEY "Knurled" Recess Ball Bearing Collar automatically sets the tube beyond the face of the sheet for "belling or flaring." The "Knurl" eliminates spinning of the tube during the rolling operation, saving labor. PAT. PENDING — Only FRANKLIN has this feature.

NO. 3

DUDLEY "Deep" Recess Ball Bearing Collar to be used in expanding the outflow end where tubes extend beyond the face of the sheet — collar clears end of tube and bears against the face of the sheet. Thus, permitting equal entrance depth of the expanding tool. Only FRANKLIN has this feature.

Dudley Electronic Tube Expander Controls are calibrated to use the Franklin Precision Tube Expander—for accurate results specify Franklin Tube Expanders

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NEW EQUIPMENT and SUPPLIES for the Plant Engineer and Operating Force

Free additional information is available to readers of Southern Power & Industry. Check item number on the postage free service coupon post card—page 17.

Flexible Valve Shield

L-1 INDUSTRIAL PRODUCTS COMPANY, 2820 N. Fourth St., Philadelphia 33, Pa., has introduced a new flexible valve shield made of neoprene synthetic rubber for use on valves handling acids and other hazardous chemicals.

The shield cups the stem and the packing gland and prevents acid from spraying on the operator or nearby workers. It is molded in the shape of a flower pot. To install it, a hole of slightly smaller diameter than the valve stem is cut or punched in the bottom. The valve wheel is removed and the shield pulled down over the stem so that it covers the packing gland. It doesn't have to be wired in place and can be installed while the valve is in service. Where necessary, the edge of the skirt can be trimmed to suit the contour of the valve body.

A major advantage of the shield is its flexibility. It can be turned back to inspect the valve or to tighten the packing gland nuts.

Flexible valve shield of *Industrial Products Company* prevents acid from spraying on operator if valve packing fails. Shield is made of neoprene synthetic rubber," which is resistant to most chemicals and to deterioration by sunlight. Idea for the shield originated in a du Pont chemical plant.

Static-Free Conveyor Belt

L-2 MAIN BELTING COMPANY, 1214 Carpenter Street, Philadelphia 47, Penna., announce their Mark 40 static-free belt for safely conveying materials under conditions in which a static charge is either undesirable or dangerous, such as bulk explosives, grain dust in elevators and paper where static may cause unwanted adherence to the belt.

Main's heavy duty canvas belt has a conductive neoprene coating which dissipates any static charge before it is built up—without grounding wires or special equipment. It is available in either 37½ or 39 oz duck and is made in any width up to 108 in.

Belt Grinding Attachment

L-3 BUCKEYE TOOLS CORPORATION, 29 West Apple St., Dayton 1, Ohio, have announced their belt grinding attachment which successfully combines the maneuverability of the portable horizontal grinder with the utility of the abrasive belt, opening up a new field of applications for this method of grinding.

Manufacturer emphasizes that the attachment mounted on a Buckeye horizontal grinder, will pare production time and costs on many applications where mounted wheels, abrasive discs, snagging wheels, cones and hand files have provided only a partial solution to grinding problems. Used for die and mould grinding, edge breaking, weld grinding and for surface finishing on any contour, the belt grinding attachment will provide a fine finish, free from lap, gouge or chatter marks.

Buckeye Tools Corporation's belt grind attachment consists of a contact wheel mounted on the tool spindle, a supporting arm mechanism and an idler pulley. Contact wheel provides backing for abrasive belt, which is aligned and supported by idler pulley.

(continued on page 10)

A belt stacker designed by Jeffrey Engineers becomes an important part of a new-type storage system installed in Florida. Result: Continuous, dependable operation and accurate blending.

Saving: A unique system, the facilities of which prevent delay of railroad equipment and provide better service to customers by permitting quicker deliveries of more-accurately-blended phosphate rock.

How it works: From track hopper rock is fed at 600 to 800 T.P.H. on to a Jeffrey 36" belt conveyor, running up an 80-foot high Stacker which pivots (see photo) over a wide semicircle. Rock is dropped on storage piles consisting of various grades at different points. Grades are blended by proportioning through gates and reclaimed by other Jeffrey belts operating in tunnels under piles. Rock can be removed at controlled rate from any point in the pile, or at several points at once.

This is just one of the many Jeffrey-equipped jobs on which our engineers projected an ingenious application of the Belt Stacker. For applied engineering on those tough assignments — call on Jeffrey.

- **Car Pullers** **Bucket Elevators** **Grizzlies** **Crushers**
- **Pulverizers** **Magnetic Separators** **Chains** **Dryers**
- **Coolers** **Stackers** **Conveyors** **Packers**

JEFFREY

1877 75 1952

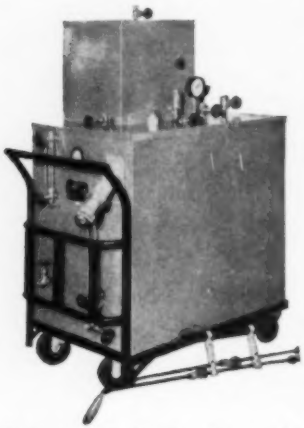
SOUTHERN POWER & INDUSTRY for OCTOBER, 1952 9

new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

Steam Cleaning Unit

L-4 LIVINGSTONE ENGINEERING COMPANY, 100 Grove St., Worcester 5, Mass., announces important improvements in the SPEEDYLECTRIC Steam-Jet Cleaner Model JC-30.



Livingstone Engineering Company's Steam-Jet Cleaner JC-30 for cleaning processing equipment, machine tools, windows and lighting fixtures in the plant during regular working hours.

Similar in general design and construction to the original JC-30, this improved unit operates at higher pressures (to 200 psi) increasing effectiveness and speed with steam jets of supersonic velocity. Hot dry steam alone or with solvents, soap or detergents atomized under finger-tip control of the operator blasts the object to be cleaned at jet speeds up to 1200 feet per second. Unlike cleaners which depend for their cleaning action on many gallons of hot water under pressure, this easily portable unit can be used indoors, cleaning and sterilizing without flooding the working area or disturbing operators at nearby machines.

Packaged Steam Generator

L-5 THE TITUSVILLE IRON WORKS CO., Division of Struthers Wells Corp., Titusville, Pa., has introduced the Type WTP Steam Generator, a completely shop-assembled water tube boiler, available in capacities from 7,500 to 27,500 lb/hr.

The unit can be fired with heavy oil; combination heavy oil and gas; light oil; combination light oil and gas; natural gas; manufactured gas; and coke oven gas.

This equipment is shipped as a complete package with all components installed, including pressure parts, refractories, insulation, casing, steam trimmings, feedwater regulator, forced draft fan, burner, combustion controls and safety flame-failure controls.

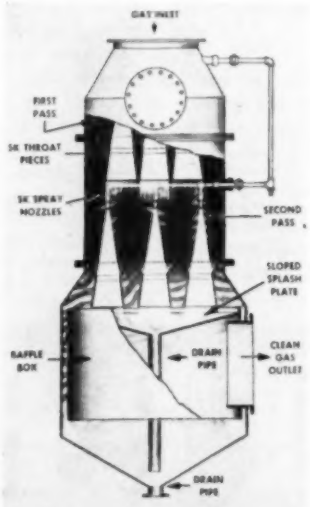
Only simple foundations are required and field installation work is confined almost entirely to connections to oil, gas, water, electrical and steam services.

"Packaged" Gas Scrubber

L-6 SCHUTTE AND KOERTING COMPANY, Cornwells Heights, Pa., has introduced the SK "Packaged" Gas Scrubber which will handle gas containing wettable solids and condensable gases as well as gases and solids which can be cleaned by obtaining a chemical reaction between the gas or solids and selected spray liquid.

In the case of gases containing non-wettable solids or dust—carbon black or metal oxides for example—a suitable wetting agent can be introduced into the spray liquid.

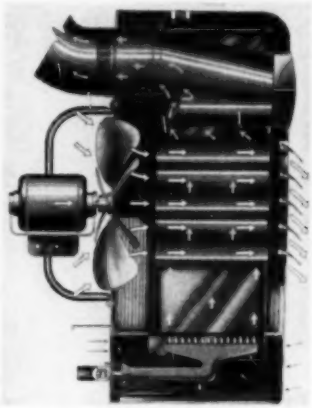
Component parts of this unit are the scrubber box, spray nozzles, and throat pieces. The scrubber box, enclosing all components, is divided into compartments or "banks." Units can be constructed with as many banks as necessary; however, two are sufficient for most operations. The number of banks, nozzles and throat pieces per bank are determined by the volume and characteristics of the gas and the scrubbing efficiency desired.



Features of *Schutte and Koerting Company's* "packaged" gas scrubber unit include: foam surge will not choke unit; maximum contact between spray liquid and gas; integral separating unit for separating spray liquid after scrubbing; can be arranged for vertical down-flow or horizontal operation; and operation with a minimum loss of pressure.

Gas-Fired Unit Heater

L-7 THE TRANE COMPANY, La Crosse, Wis., has introduced a new line of gas-fired unit heaters.



Cut-away view of *The Trane Company's* gas fired unit heater. Units available in capacities from 50,000 to 230,000 Btu-hr input.

Heart of the new design is the heat exchanger, with its horizontal steel tubes staggered to provide maximum areas of prime heat surface. The tubes are rolled into heavy end sheets, boiler tube style, and are fortified with additional outer and inner roller flanges. No cement or gaskets are used in the heat exchanger's locked seam construction. Air-tight operation is assured by the continuous seam welding of end plates to sides. A brush can be passed between the tubes for easy cleaning.

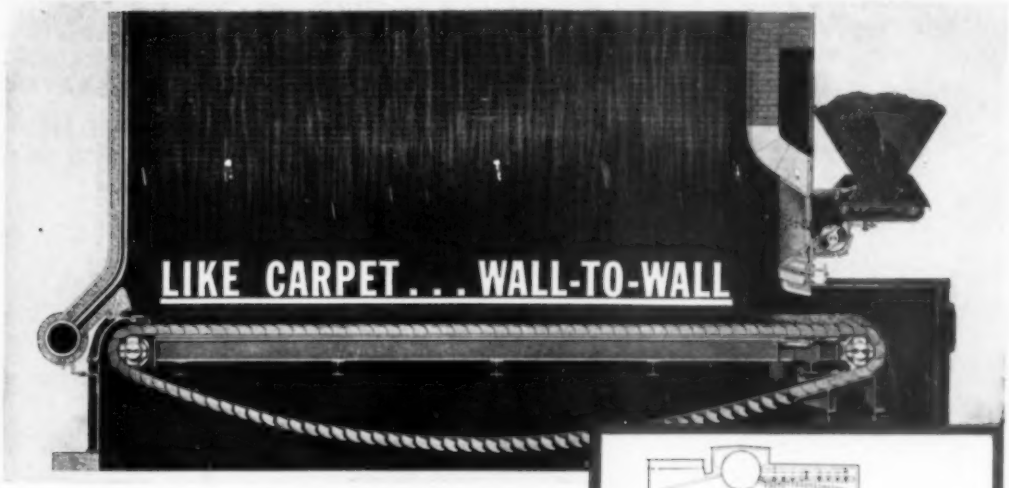
The heat generator includes burner heads and mixing tubes of one-piece cast iron construction. They are engineered for efficient combustion of natural, manufactured, mixed, or liquid petroleum gas. Burners, pilot, and control valves are combined in one removable drawer-type assembly for easy maintenance. Built-in safety controls include a high-limit switch to prevent overheating, and automatic cutoff of both pilot light and main gas supply. An integral draft diverter allows back and down drafts to bypass the burner assembly without affecting normal operation.

(*Continued on page* 200)

CUTTING A BOILER IN TWO

to show why we dare call this stoker the

PERFECT SPREAD

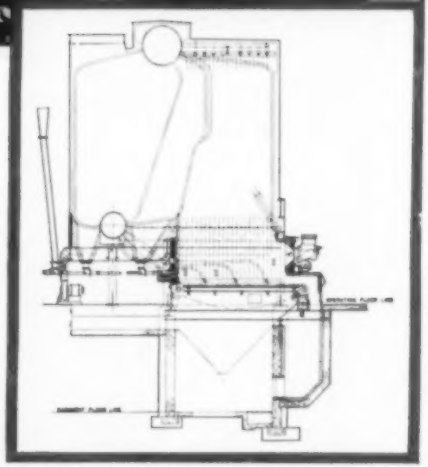


It's simple . . . it's economical and it
WON'T CLOG ON WET COAL

WHETHER THE COAL is bone dry or sopping wet, every AE conveyor feeder can deliver from 50 to 7,500 lbs. of coal per hour. The high traction principle employed—and its exclusive spiral overthrow rotor—deliver absolute uniformity of spread over the whole grate area, dependably, continually and without troublesome coal agitators.

Perfect Spread Stokers are built in a wide range of sizes, capacities and grate types . . . but *all* of them are equipped with American Engineering's exclusive conveyor feeder and rotor. This is one feeder that *won't clog on wet coal* . . . one whose true, continuous feeding is universally acknowledged as unexcelled.

If you need extra steam capacity, wish to replace obsolete equipment or abandon hand firing, mail coupon for full facts about Perfect Spread Stokers.



The above installation, designed to burn Ohio coal 11,800 B.T.U.s "as fired", 12.7% ash, 4.4% sul., with 2,000° F.—A.S.T.

AMERICAN ENGINEERING
COMPANY
PHILADELPHIA 25, PENNA.

AE Products are: Taylor and Perfect Spread Stokers, Marine Deck Auxiliaries, Hele-Shaw and Hydromite Fluid Power, Le-Hed Hoists, Le-Hed Car Pullers.

American Engineering Company
2421 Aramingo Ave., Philadelphia, Penna.

Gentlemen:- We are interested in getting top efficiency from both low and high ash coals. Please send us full information about Perfect Spread Stokers.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

STEAM POWER for Kaiser

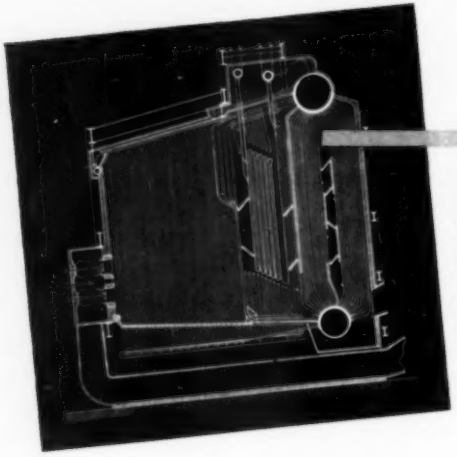
15 FOSTER WHEELER STEAM GENERATORS SERVE THE SOUTH'S BIG NEW

For every pound of aluminum produced in this new 400,000,000 pound-per-year plant, Kaiser will need about 10 kwh of electric power.

To meet this enormous, almost constant demand, Kaiser Engineers selected a plant consisting of gas-burning radial engines, and 15 Foster Wheeler "D" type boilers to supply steam for the turbine-generators.

These boilers, with a combined capacity of 3,375,000 lb of steam per hr, are ideally suited to Kaiser's requirements for reliability, ease of operation and high availability. And they are a natural for use in the South where a temperate climate permits low-cost, semi-outdoor-type installations.

This installation is another example of Foster Wheeler's ability to design and construct power-producing equipment to meet the needs of industry.



Cross-section of one of the 15 duplicate Foster Wheeler "D" type steam generators for Kaiser Aluminum. The regenerative air heater is not shown.

CAPACITY	225,000 lb per hr
PRESSURE	900 psig
FINAL STEAM TEMPERATURE	905 F
TEMPERATURE FEEDWATER INLET	350 F
FIRING	Natural Gas

For information on your steam generation

Aluminum

INDUSTRY AT CHALMETTE, LA.

Aerial view showing first six boilers and six of the eight stacks under construction. Nine more boilers, now being fabricated, will be located in extension of the present line. Turbine room is to the left.

requirements, write to: FOSTER WHEELER CORPORATION, 165 BROADWAY, NEW YORK 6, NEW YORK

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and FUSETRON dual-element FUSES provide 10 POINT PROTECTION

1 *Protect against short-circuits.

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3 Protect against needless blows caused by excessive heating — lesser resistance results in cooler operation.

4 Provide thermal protection — for panels and switches against damage from heating due to poor contact.

5 Protect motors against burnout from overloading.

6 Protect motors against burnout due to single phasing.

7 Give DOUBLE burnout protection to large motors — without extra cost.

8 Make protection of small motors simple and inexpensive.

9 Protect against waste of space and money — permit use of proper size switches and panels.

10 Protect coils, transformers and solenoids against burnout.

*Fusetron Fuses have high interrupting capacity as shown by tests of the Electrical Testing Laboratories of New York City in December 1947.

"...They seem very pleased with our work and we give a good deal of the credit to FUSETRON FUSES!"

ROY SPRINGER, Proprietor
ROSS ELECTRIC CO., Superior, Wisc.

Here are the Details:

"In the fall of 1947 the Russell Creamery Company, largest creamery in Superior, asked us to see what we could do to stop blowing of main fuses. They were having trouble; whenever a main fuse blew the whole creamery was affected.

"We carefully checked the load and found that it was unbalanced but that 600 ampere fuses were the size that should be used.

"The load was balanced and, to be sure poor contact was eliminated, the clips in the switch were replaced. Then FUSETRON dual-element Fuses in 600 ampere size were installed.

"Since then Russell Creamery Co. has not had to call us once to replace a main fuse.

"Later Russell Creamery built an addition to their plant. We got the job. It was still not necessary to change the 600 ampere service.

"They seem very pleased with our work and we give a good deal of the credit to Fusetron Fuses."

FUSETRON
TRUSTWORTHY NAMES IN ELECTRICAL PROTECTION
BUSS

Don't Risk Losses

One **needless** shutdown...
One **lost** motor...
One **destroyed** switch or panel
One **burned out** solenoid...

May cost you far more than replacing every ordinary fuse with a Fusetron dual-element Fuse.

MAIL THE COUPON NOW
for complete information about the All-Purpose Protection of FUSETRON Dual-Element FUSES.

BUSSMANN Mfg. Co. (Division of McGraw Electric Co.)
University at Jefferson, St. Louis 7, Mo.

Please send me complete facts about FUSETRON dual-element Fuses.

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350	357	370	391	403	410	461	463	468	485	491	501	508	517	524	525
540	545	564	601	603	606	618	622	630	651	654	656	702	705	710	717
766	788	825	826	830	831	833	931	957	968	992	B10	B11	B12	B13	B14
B15	B16	B17	B18	B19	B20	B21	B22	B23							

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833 **BRONZE BEARINGS FOR MOTORS**—Catalog 248—Gives complete specifications of stock bronze bearings particularly intended for application to electric motors.—THE BUNTING BRASS & BRONZE CO.

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931 **VACUUM CLEANING**—Form A-718 pictures a wide variety of plant cleaning and production jobs, through illustration of typical plants, done by Hofman vacuum cleaning equipment.—U. S. HOFFMAN MACHINERY CORP.

957 **ROTARY DUMPERS FOR MINE AND RAILROAD CARS** — Booklet 2048-A — Describes and illustrates rotary railroad car dumpers, capable of unloading open-type railroad cars at the rate of 1½ min. to a full cycle of dumping and return.—LINK-BELT CO.

958 **INDUSTRIAL INSULATION**—Bulletin and samples indicate the advantages of FC "foamglas" permanent industrial insulation, made up of millions of tiny glass bubbles that prevent moisture and vapor travel. — PITTSBURGH-CORNING CORP.

992 **FIRE PROTECTION**—Bulletin 3819 describes Blaw-Knox Deluge systems, wet and dry pipe sprinkler systems, water spray and fog systems, rate-of-rise sprinkler systems, etc., and indicates how a sprinkler system pays for itself out of insurance savings. — BLAW-KNOX SPRINKLER DIV., BLAW-KNOX CONSTRUCTION CO.

Continued on page 198

10-52-2

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350	357	370	391	403	410	461	463	468	485	491	501	508	517	524	525
540	545	564	601	603	606	618	622	630	651	654	656	702	705	710	717
766	788	825	826	830	831	833	931	957	958	992	B10	B11	B12	B13	B14
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Right down the line, in most every industry, you'll find the leading companies – as well as the smaller companies that may well be tomorrow's leaders – depending on C-E Vertical Unit Boilers for dependable, low-cost steam.

Take Pulp and Paper Mills for example. Few industries use more steam or have a larger stake in the economy and reliability of their steam generating equipment. The list below is just a sample of the nationally-known leaders in the pulp and paper field that have Vertical-Unit Boilers in service at one or more mills.

Only larger companies are listed because here, as in any industry, the buying decisions of big companies are especially significant. Such companies have the breadth of experience, the diversified operating conditions and the organization necessary to explore and evaluate the merits of the equipment they need.

So, where you need boilers – in capacities from 10,000 to 350,000 pounds of steam per hour – take a tip from the leaders. Discover – as they have – the advanced design . . . sound construction . . . proved reliability of C-E Vertical-Unit Boilers.

Leading Pulp and Paper Mills that have Purchased VU Units for One or more Plants

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Chesapeake Corporation
Container Corp. of America
Fraser Companies, Ltd.
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National Container Corporation
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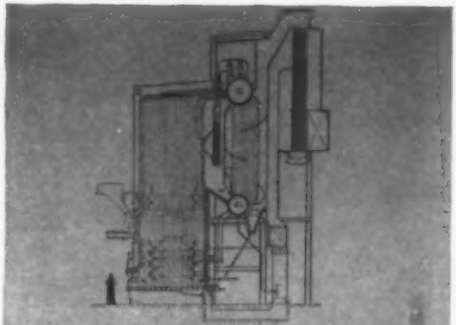
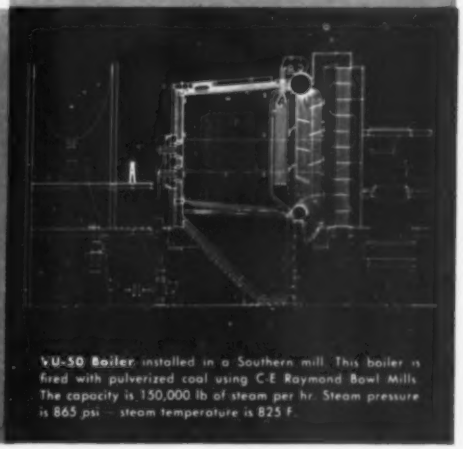


VU-80 Boiler – This unit, one of two duplicates, is installed at a West Coast mill. It is designed to burn hogged wood on a high-set spreader stoker. Capacity – 150,000 lb of steam per hr; operating pressure – 570 psi; steam temperature 675 F.

VU-10 Boiler, one of two in a Midwestern plant. Fired by coal, using a C-E Spreader Stoker. Capacity – 18,000 lb of steam per hr at 200 psi; no superheat. VU-10 capacities range from 10,000 to 60,000 lb of steam per hr.



VU-50 Boiler installed in a Southern mill. This boiler is fired with pulverized coal using C-E Raymond Bowl Mills. The capacity is 150,000 lb of steam per hr. Steam pressure is 865 psi – steam temperature is 825 F.

C-E

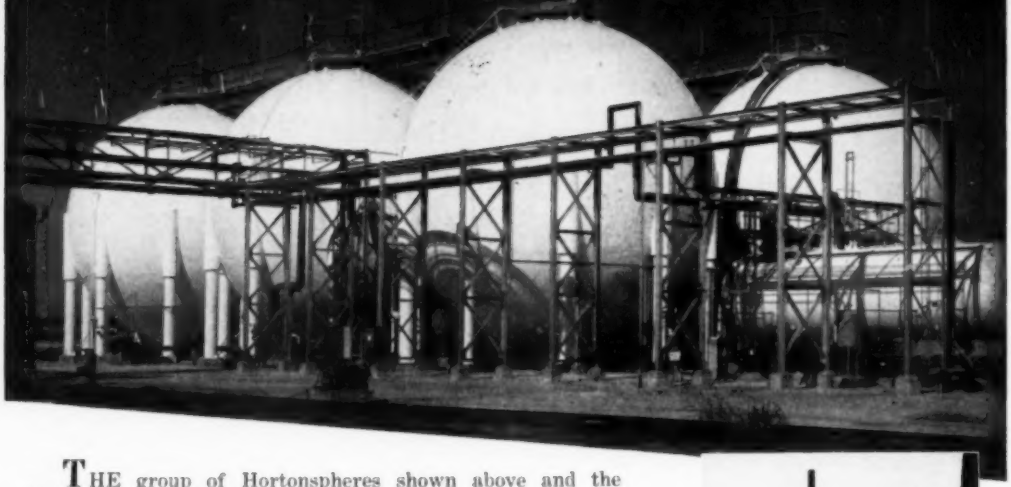
COMBUSTION ENGINEERING–SUPERHEATER, INC.

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.

B-612A

ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS AND AIR HEATERS

CHEMICAL STORAGE *assumes Many Shapes...to do a Better Job...*



THE group of Hortonspheres shown above and the Horton cone roof and umbrella roof tanks at the right and below are located at a large Texas chemical plant. Together with many other types of Horton tanks, they illustrate how the Chicago Bridge & Iron Company builds storage facilities to fit the specific plant requirements of the chemical industry.

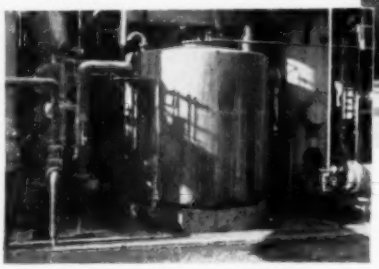
The Hortonspheres are used to store volatile chemicals without excessive evaporation losses. Their spherical shape effectively resists internal pressures and eliminates venting until the pressure exceeds the setting of the relief valve.

The Horton cone roof and umbrella roof tanks are built to special dimensions and used to store caustic solutions.

Pressure storage tanks, cone roof tanks, and umbrella roof tanks are only three of the many types of structures we build for the chemical industry. Write our nearest office for further information.

Above: 20-ft. by 40-ft. Horton umbrella roof tank storing 10 per cent caustic at a large Texas chemical plant.

Above: 7,500-bbl. Hortonspheres —43 ft. 6 in. in diam. storing anhydrous ammonia at a large Texas chemical plant.



Right: 10-ft. by 10-ft. Horton flat-bottom cone roof tank storing low salt caustic.

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Birmingham 1.....1530 North Fiftieth St.
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Detroit 26.....1510 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston 2.....2114 C&I Life Bldg.
Los Angeles 17...1517 General Petroleum Bldg.
New York 6.....3313—165 Broadway Bldg.
Philadelphia 3..1619—1700 Walnut Street Bldg.
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You can look for *three* definite savings with Durasheath. It costs less to install. It is flexible and light. It lasts longer. Its special neoprene jacket is tough enough to stand up to every natural enemy of cable life. It simplifies stock inventory. You need purchase only *one* cable—versatile Durasheath—to meet every electrical distribution requirement.

Ask your nearest Anaconda Sales Office or Distributor for the whole story on Durasheath. Then convince yourself how much you will save by using Durasheath. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

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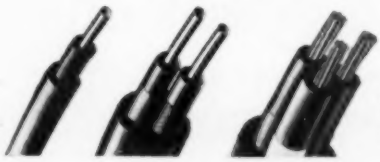
available in all sizes—from large to small—single and multi-conductor.

for traffic control, airport† power and lighting, mines, industrial plants, railroads, street lighting, and many other uses.



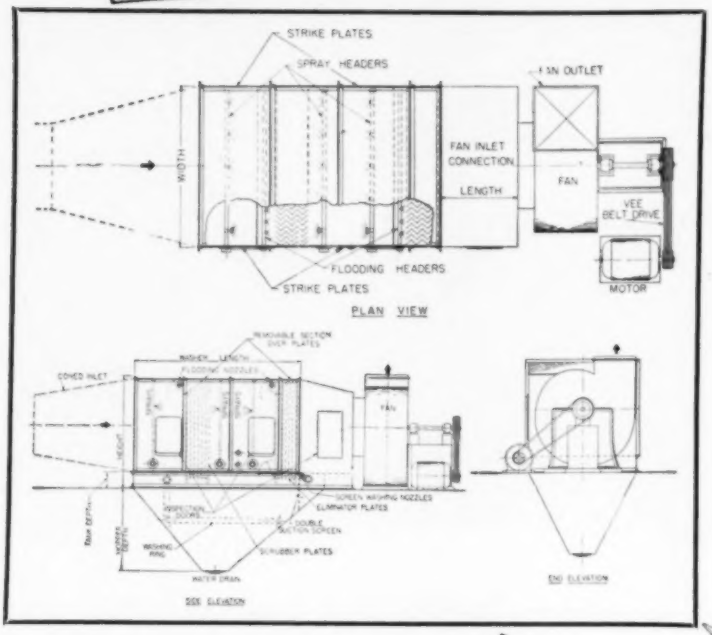
†when ordered to CAA Specifications L-824.

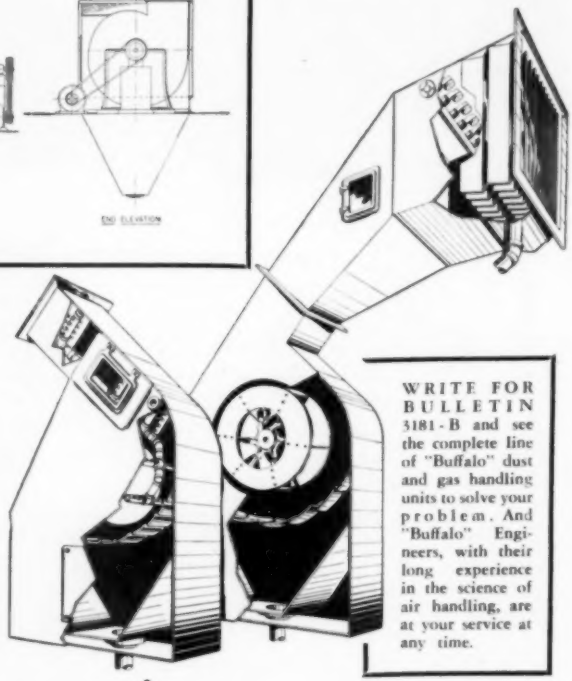
**for voltages over 5kv consultation with Anaconda Engineers is recommended.

"Buffalo"

Tips on DUST ELIMINATION

WET-DUST ARRESTORS for LOW-COST OPERATION





Low-resistance "Buffalo" Type DC Static Air Washer does a thorough air cleaning job by passing air through three main banks of sprays, a set of scrubber plates and a set of eliminator plates. There is no free moisture carry-over. Dust collects in hopper for easy removal. Regular cleaning maintenance is simple, since plates are under constant spray. Arrangement shown above is for dust loadings up to 8 grains per cubic foot, though units for heavier loadings may be had.

Every dust elimination problem is different and demands specialized equipment. "Buffalo" builds 8 types of units, each in a variety of sizes and arrangements, to handle any dust load. At right is the "Buffalo" Hydro-Volute Scrubber, a compact fan-and-washer unit for removal of various dusts. Water is recirculated at low pressure. Water consumption is therefore very low.

WRITE FOR BULLETIN 3181-B and see the complete line of "Buffalo" dust and gas handling units to solve your problem. And "Buffalo" Engineers, with their long experience in the science of air handling, are at your service at any time.

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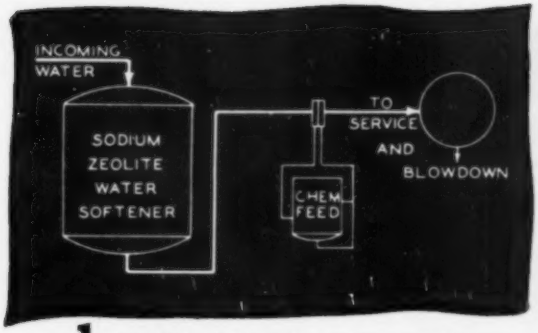
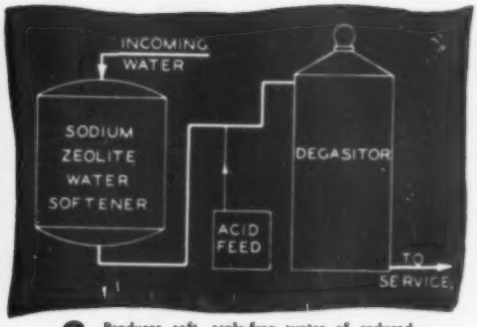
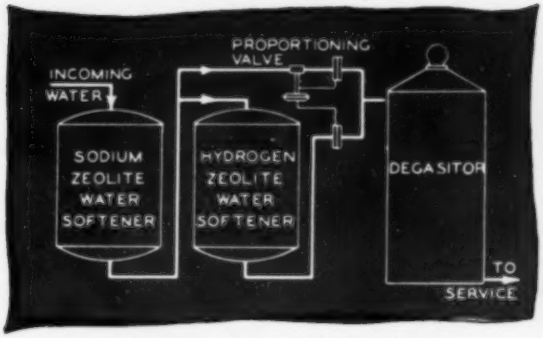


1 Gives soft, scale-free water — prevents corrosion.



2 Produces soft, scale-free water of reduced alkalinity.



3 Delivers soft, scale-free water. Reduces alkalinity to desired level and gives marked reduction in total dissolved solids.

4 Produces deionized water of highest known chemical purity. Removes CO_2, silica, and all ionizable solids.

Four ELGIN Ways . . .

to Control Dissolved Solids and Alkalinity of Boiler Feed and Process Water

With 43 years of experience in the design and manufacture of water conditioning equipment, Elgin is qualified to provide exactly the type of water conditioning system best suited to your specific needs.

This is well illustrated by the four typical ion exchange systems diagramed above which deliver water "tailored" to the specific requirements of any boiler plant or processing operation. It will pay you to study these diagrams one by one.

In many cases a zeolite water softener supplemented by chemical treatment (diagram 1) will deliver water of suitable quality for the purpose at low cost.

Where soft, scale-free water of reduced alkalinity is required, zeolite softening plus acid feed and degasification (diagram 2) is the economical answer for many water supplies.

Should a marked reduction in total dissolved solids also be desired, blended sodium and hydrogen zeolite softened water plus degasification (diagram 3) will best do the job.

For the highest quality water known today, the Ultra-Deionizer (diagram 4) is the ultimate in water conditioning. This remarkable single-tank unit which contains mixed anion and cation exchange resins, delivers chemically pure water, free of silica and CO_2 at an amazingly low cost.

Yes, these are typical examples of the broad scope of Elgin water conditioning. One of our engineers will be glad to study your conditions and lay out a "tailored" system which will best fit your need and budget — permanently solve your water problem. Write us today.

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(WASTING MANPOWER TO OPERATE HARD-TO-CLOSE HIGH PRESSURE VALVES, ESPECIALLY IN AN EMERGENCY)

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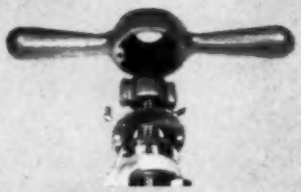
One man using an Edward Impactor handwheel can equal the closing force of three strong men on an ordinary handwheel. Saves space, can be operated in cramped quarters, uses no toggle or gears, needs no cinch bars. Standard on many valves, optional on others. Edward catalogs detail its design. Write for literature.



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Subsidiary of ROCKWELL MANUFACTURING COMPANY

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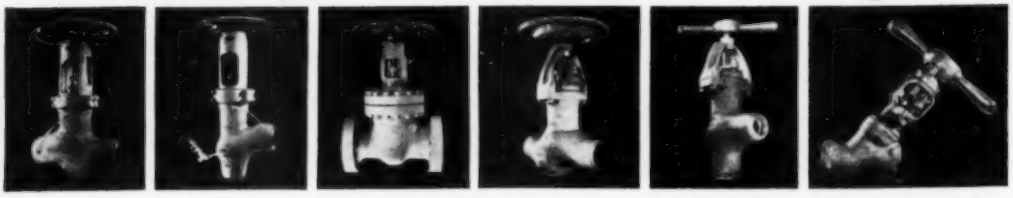
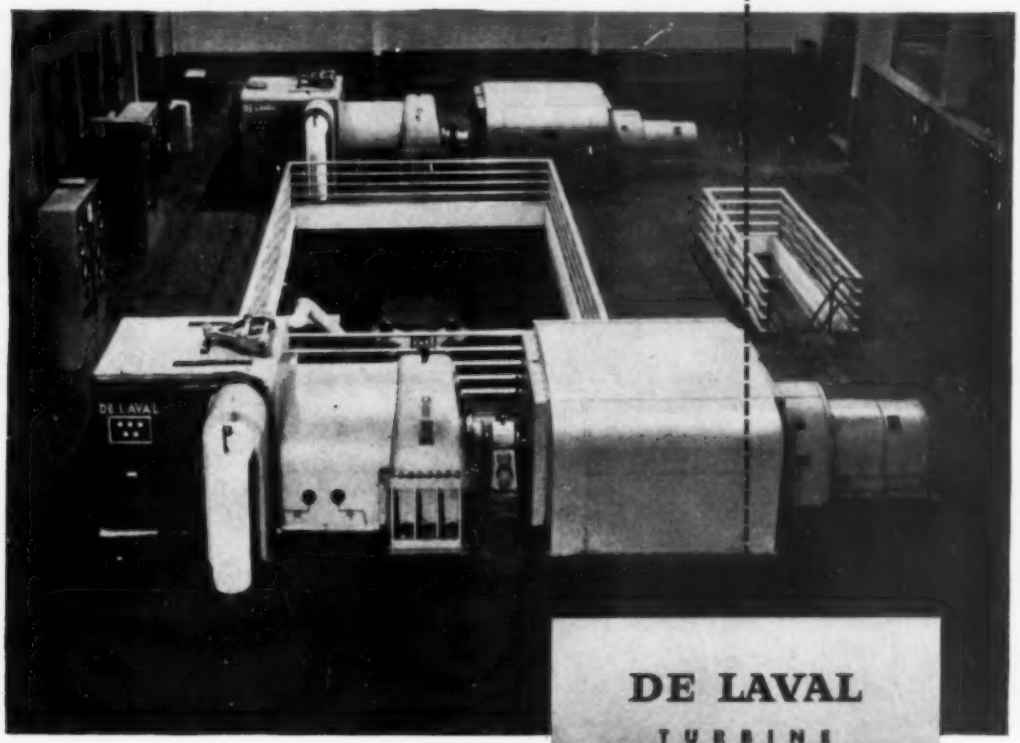
EAST CHICAGO, INDIANA

Another Product



Two thoroughbreds for the blue grass country



You are looking at "13,400 horses" that will never run in the Derby. But these two 5,000 kw De Laval Turbine Generators, installed in the municipal power plant of the City of Henderson, Kentucky, add a new, dependable source of power to the famous blue grass country. Operating conditions are 600 psi at 825F and the turbines are arranged with three points of extraction for feedwater heating.

De Laval's modern Turbine Generators come from a long, pedigreed line. In fact, we have been building turbine generators for more than a half century. You can count on De Laval units to give you year-in, year-out service. Sizes range from 25 to 11,500 kw.

Be sure to send for complete data on our power plant equipment: boiler feed pumps, mechanical drive turbines, centrifugal pumps and IMO rotary oil pumps.

Turbine Generators

DE LAVAL STEAM TURBINE COMPANY
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DL-183

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In all types of Coppus-Dennis FANMIX Burners — straight gas or combination gas-oil — we utilize the energy of the fuel under pressure to drive the burner fan and deliver air in the proper proportion to the fuel flow. This exclusive "pinwheel action" *mechanically* mixes fuel and air in exactly the right proportions for truly radiant, non-luminous heat.

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FANMIX Saves On Both Old and New Installations

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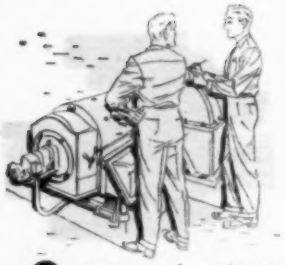
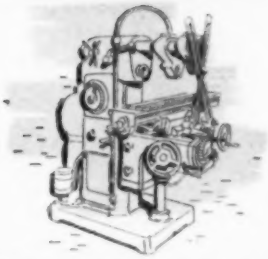
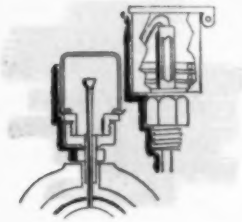


❶ surveys of equipment

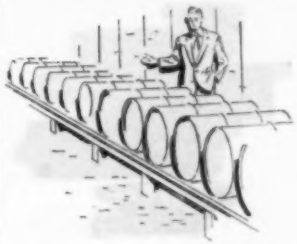


❷ specific recommendations

❸ lubrication charts



❹ application methods



❺ storage and handling

❻ individual problems

Gulf's comprehensive lubrication plan can help you reduce costs straight down the line. Call your nearest Gulf office today.

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PITTSBURGH 30, PENNSYLVANIA

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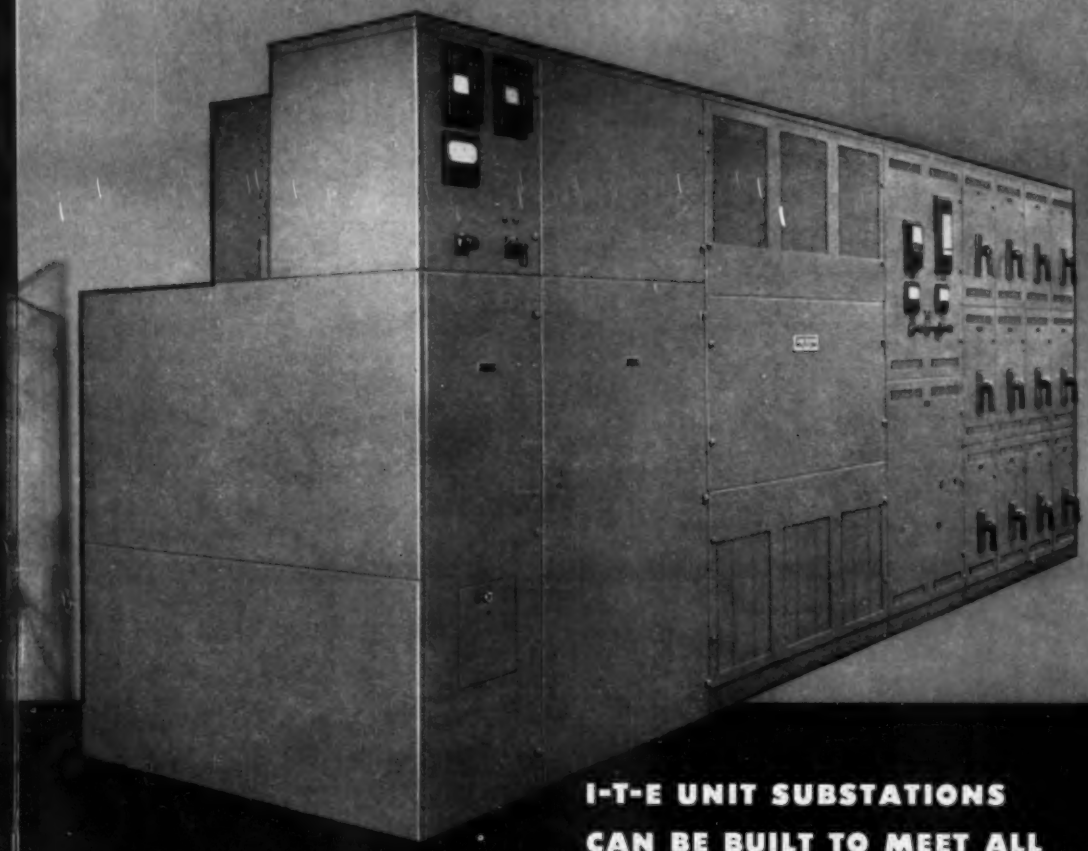

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Indoor and outdoor—in any required ratings

TRANSFORMER TYPES INCLUDE:

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Non-inflammable liquid-filled
Class B air-cooled (illustrated above)
Class H air-cooled
Class H, nitrogen-filled, sealed tank

YOU SAVE THROUGH—

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2. Lower conductor cost—shorter runs of LV cable.
3. Shorter installation time—Substations shipped as complete packages.
4. Use of lower interrupting capacity breakers.

GET THE FULL STORY—

See your local I-T-E representative for details—or write for Catalog Section 9000 *today*.

FAILURE COST YOUR PLANT?

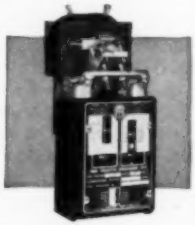
Suppose a prolonged power interruption suddenly hit your plant! How much would it cost you in lost production, down-time—perhaps ruined product, equipment damaged beyond repair?

To all plants, *service continuity* means profits. In some, service continuity is the most important single consideration in planning the vital electrical distribution system.

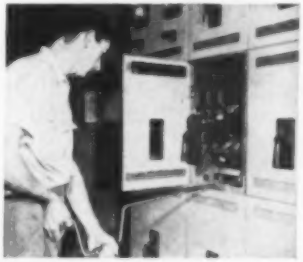
Assure service continuity—Install modern I-T-E Unit Substations

No matter what your service continuity requirements may be, I-T-E can offer you the benefits of long experience—supply the equipment to meet them all. You get:

FLEXIBLE SYSTEM PLANNING. *Sectionalization* (I-T-E Unit Substations strategically spotted throughout the plant) *limits* the area affected by power interruption. You can plan your system to provide immediate restoration of service—or actual *elimination* of interruption on unaffected circuits.



SELECTIVE TRIPPING. Sectionalization can be carried right down to the *individual* I-T-E circuit breaker—the individual machine or feeder. The versatile I-T-E Direct-Acting Selective Overcurrent Trip Device helps *isolate* faults. If there's a sustained overcurrent or short circuit in any branch of the system, only the breaker closest to the fault will open.



MODERN DRAWOUT CONSTRUCTION. Even maintenance requires little or no down-time. With modern I-T-E drawout construction, total outage time during maintenance is only a few minutes. Circuit breakers of like characteristics are interchangeable. One spare breaker—for quick replacement—provides economical insurance for a number of feeder circuits.

I-T-E

UNIT SUBSTATIONS

I-T-E CIRCUIT BREAKER CO. • 19TH & HAMILTON STS. • PHILA. 30, PA.

CANADIAN MFG. & SALES: EASTERN POWER DEVICES, LTD., TORONTO • EXPORT SALES: PHILIPS EXPORT CORP., N. Y. 17, N. Y.

from 1/2 to 100 hp

I-R AIR-COOLED COMPRESSORS

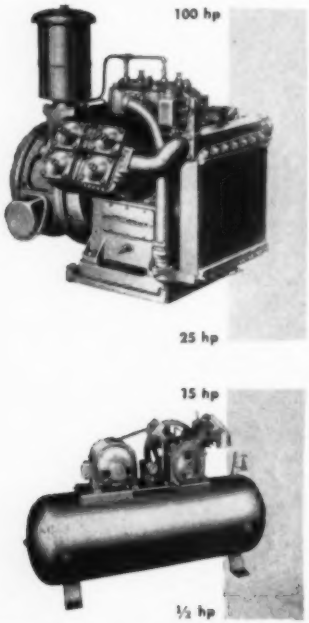
give you these important advantages

This 50-horsepower V-belt driven Type 40 compressor supplies air in an abrasive-manufacturing plant.

- **SMALL FLOOR SPACE**
- **NO SPECIAL FOUNDATION**
- **EASY MOVABILITY**
- **NO COOLING WATER REQUIRED**
- **NO WATER PIPING**
- **NO DANGER OF FREEZING**

● Wherever compactness and light weight, low installation and operating costs, dependable service, and minimum attendance are important factors, Ingersoll-Rand air-cooled compressors fill all the requirements.

Their wide acceptance by all types of industry—from mines to power plants—from drug manufacturers to cargo ships—proves their versatility and dependability. For main air supply, for supplementing the capacity of larger compressors or for de-centralized air systems, Type 30 and Type 40 compressors are ideal. Your nearest I-R representative will be happy to apply his knowledge and experience to your particular problem.



Type 40 Compressors are two-stage, air-cooled . . . sizes from 25 to 100 hp. Discharge pressures from 80 to 125 psi, also up to 200 psi. . . . Three types of drive: "Motor-compressor," with built-in electric motor; flexible coupled; or V-belt driven. Durable, efficient Channel Valves, Timken tapered-roller main bearings and Constant-level lubrication are additional features. Dual-Control permits selection of constant speed or automatic-start-and-stop control.

Type 30 Compressors come in sizes from ½ to 15 hp . . . handle smaller volumes of air at pressures from 5 to 3500 psi. Available as complete receiver mounted units, with base-plate mountings, or as bare compressor units. Can be equipped with automatic-start-and-stop control, constant-speed control, or dual-control to permit selection of either type. For special service such as instrument control or agitation, certain sizes are available with non-lubricated cylinders.

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

PUMPS · CONDENSERS · AIR AND ELECTRIC TOOLS · ROCK DRILLS

FOR CLASSY SHOPS

. . . OR BUSY PLANTS

THERMOLIER UNIT HEATERS

The condensed table below is a quick guide to the selection of the correct Thermolier for specific conditions. The capacities, when motors are operating at normal speeds, are based on Standard Basis of Rating: 2 lb. steam pressure and 60° F entering air temperature.

Grinnell Thermoliers are tested and they are rated in strict accordance with rules of the Industrial Unit Heaters Association.

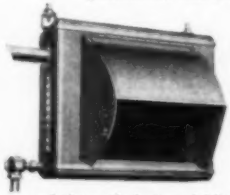
All Thermoliers can be operated at working steam pressures up to 125 psi and steam temp. up to 406° F.

A MODEL AND SIZE FOR EVERY PURPOSE

horizontal delivery

textile (horizontal delivery)

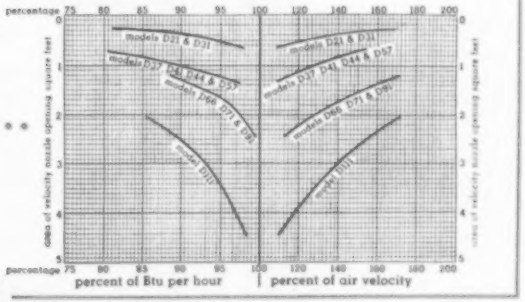
vertical delivery



velocity nozzle (horizontal delivery)

model	total heat delivered, Btu per hr	sq ft edr (nominal)	air velocity at exit, louvers open, lin. ft. per min.
horizontal delivery			
D21	35,600	148	786
D31	48,700	203	851
D37	62,200	259	753
D41	71,000	295	901
D44	84,100	350	887
D57	101,300	422	1016
D66	128,700	536	779
D71	151,700	632	977
D91	196,000	817	985
D111	275,300	1147	1048
Textile			
TX70	69,800	291	826
TX110	113,700	474	877
vertical delivery			
VA1042	50,800	212	1399
VA1045	73,600	307	1287
VA1065	109,400	456	1354
VA1075	145,600	607	1231
VA1101	185,000	770	1495
VA1111	257,000	1071	1631

performance with velocity nozzle ▶



GRINNELL
THERMOLIER UNIT HEATERS

CALL YOUR LOCAL GRINNELL DISTRIBUTOR

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

NAVCO "Universal" PIPE SUPPORTS

Vertical adjustment up to 2½ inches can be made.

Support may be turned to any angle of 360°.

Will take care of 8 inches of travel.

Features

Universal Pipe Supports hold the pipe down as well as up. They prevent pipe from getting out of alignment, which is usual when Roller Supports are used.

They permit control of expansion movement and insure the desired free action of Slip Expansion Joints so essential in tunnel and duct work.

Expansion movement of pipe will not disturb the insulation.

Made in Cast Iron or Steel and provided with forced lubrication for lines exposed to the weather.

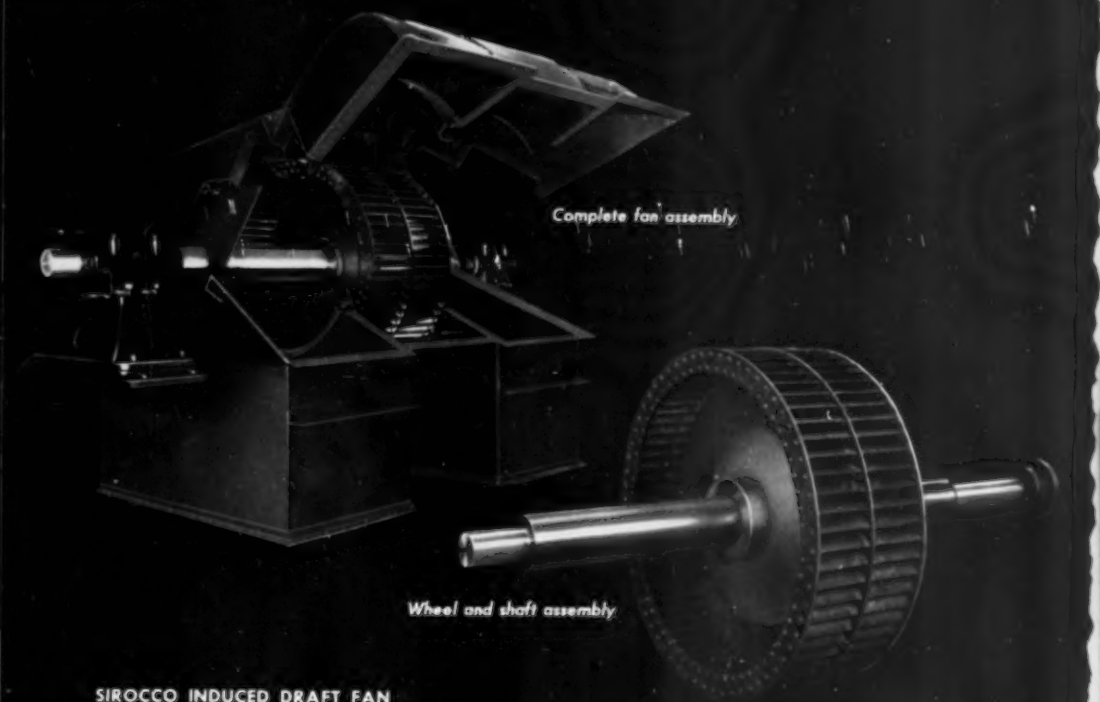
NAVCO

NAVCO PIPING

NATIONAL VALVE & MANUFACTURING COMPANY • PITTSBURGH, PA.

NEW YORK • CHICAGO • CLEVELAND • BOSTON • ATLANTA • TULSA • BUFFALO • CINCINNATI

American Blower . . . a time-honored name in air handling



SIROCCO INDUCED DRAFT FAN

Memo to Power Plant Men:

You can handle more gas per revolution at lowest tip speed with Sirocco Multi-Blade Fans than with any other type. Designed and proportioned especially for induced draft work, their operating characteristics make them particularly adaptable to your modern power plant needs.

AMERICAN BLOWER

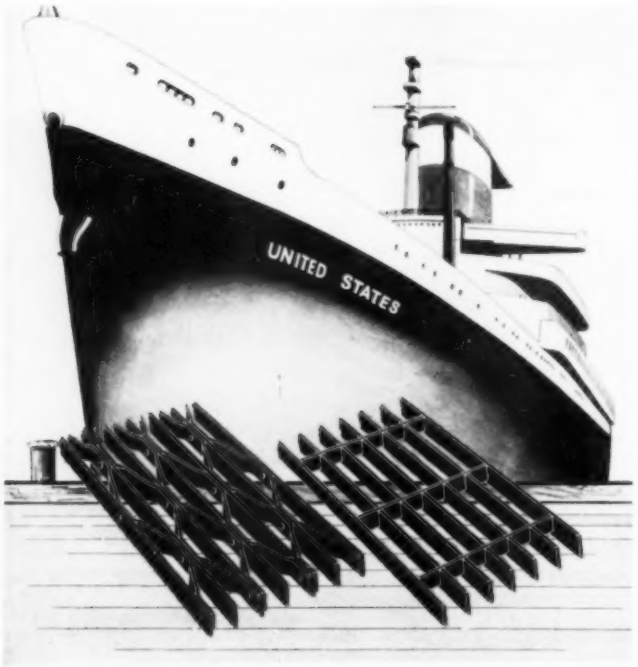
AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO
Division of American Radiator & Standard Sanitary corporation

Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • ACME CABINETS • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

BORDEN ALUMINUM FLOOR GRATING ON S.S. UNITED STATES

Aluminum grating now only slightly higher than conventional steel gratings



Brings all advantages of aluminum floor gratings within building budgets

Seen as the beginning of a new trend in construction, the rapidly expanding use of aluminum floor gratings for building was predicted today by the Borden Metal Products Co., Elizabeth, N. J. and Leeds, Ala. This company supplied much of the aluminum grating for the S. S. United States, and currently has orders amounting to many thousands of square feet for ships, power houses, sewage plants, and water-treatment works.

Borden, through many years of planned production control, can now produce aluminum floor gratings by the same commercial methods used for ordinary steel gratings. Thus the ultimate in-place cost is only slightly higher than that of conventional gratings — bringing all the advantages of aluminum to the building industry.

The installation of Borden aluminum floor gratings in the S. S. United States saved approximately one-half the weight of steel gratings. The lightness of the aluminum alloy permits sections to be removed in case of emergency or engine trouble. With 85% open construction in the grating, maximum light and air can circulate — extremely important around machinery.

Once installed the floor gratings need never be painted; the resultant savings in man hours alone makes up any difference in price. And their exclusive non-corrosive feature is extremely important to specifying engineers and architects, constructing chemical, sewage and water-treatment plants.

BORDEN MANUFACTURES EVERY TYPE FLOOR GRATING

IN FERROUS AND NON-FERROUS METALS

BORDEN ALL-WELD DESIGN

The best type for use where floors are subject to extreme corrosion or moisture — chemical plants, breweries and other process industries. There are no cracks, open joints, or holes in bars. This type made only in mild steel.

BORDEN RIVETED DESIGN

Most substantial and oldest design of grating made, permits perfect distribution of loads. Made on the truss principle, Borden Riveted Gratings are hydraulically power-forged for strength and durability. Particularly recommended for aluminum.

BORDEN PRESSURE LOCKED DESIGN

Neat, clean, durable, easy to paint and maintain. Pressure Locked Design permits maximum passage of light, heat and air. It is especially desirable in power plants, boiler rooms and all dry area. Deep cross bars increase lateral support.

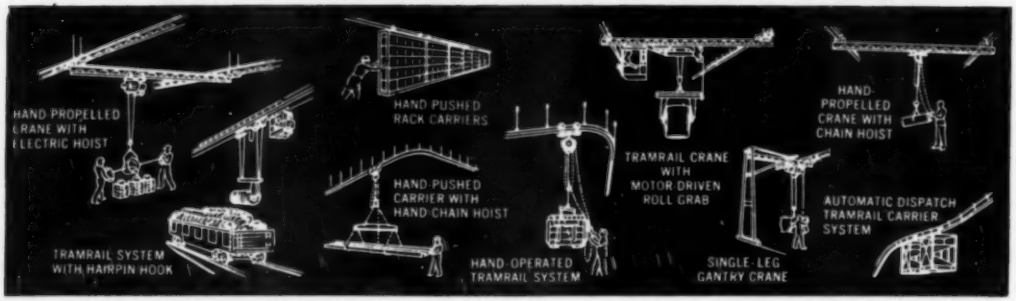
SEND FOR FREE CATALOG COVERING ALL FLOOR GRATINGS

BORDEN METAL PRODUCTS COMPANY

815 GREEN LANE Elizabeth 2-6410 ELIZABETH, N. J.

SOUTHERN DIV.—LEEDS, ALA. — MAIN PLANT—UNION, N. J.

CLEVELAND TRAMRAIL SERVES EVERY INDUSTRY



Simple hand-pushed cranes with electric hoists handle heavy loads quickly and easily.

5 tons (4545 kg.) steel sheets easily handled by one man. Hoist and carrier travel motor-driven.

Over 1,000 foundries have Cleveland Tramrail and are making big savings.

TRIED AND PROVEN COST-CUTTING EQUIPMENT

The variety of ways in which Cleveland Tramrail is serving industry is amazing. It delivers materials from storage or car or truck, directly to point of work without rehandling—transports delicate, fragile wares without damage—moves hot molten metals safely—carries materials between distant points on the same or different floors or buildings. It speeds production, improves plant efficiency and cuts costs. Regardless of size or type, most installations pay for themselves in one year and keep on paying goodly dividends year after year thereafter.

STANDARD ITEMS EASILY COMBINED TO HANDLE MATERIALS OF ANY KIND

Cleveland Tramrail consists of track, switches, carriers, cranes, hoists, grabs, etc., which can be combined in a thousand-fold ways to serve nearly every need. Equipment can be made in all variations from simple hand or electric floor-operated, to cab controlled and automatic plant-wide systems.

35,000 INSTALLATIONS

Over 7,500 customers have purchased 35,000 installations of Cleveland Tramrail and many of these are still in continuous operation after 25 or more years of service.

10-ton (9090 kg.) transfer bridge system handles giant airplanes. Cleveland Tramrail serves many large aircraft plants.

Heavy rolls of paper up to 6,000 pounds (2727 kg.) are handled with this motorized grab and crane.

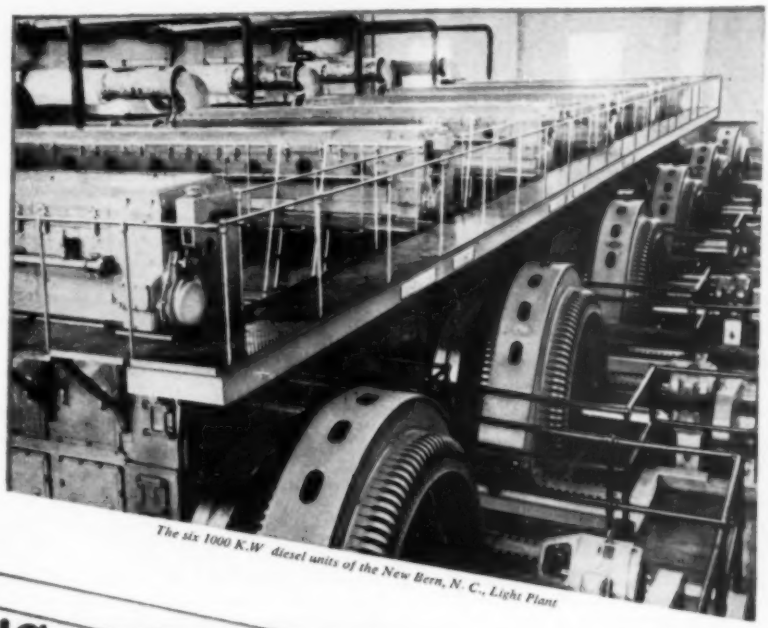
Heavy beams are easily conveyed overhead in textile weave rooms with simple inexpensive Tramrail cranes.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7451 East 284th St. Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT



The six 1000 K.W. diesel units of the New Bern, N. C., Light Plant

"Sinclair Diesel Lubricants cut consumption, keep engines cleaner"...

New Bern, N.C., Light Plant

One of the most efficiently run light plants in the country is located in New Bern, North Carolina. Six 1000 K.W. diesel units, expertly maintained and serviced, provide this pleasant community with electrical power.

W. B. Bartling, Director Public Utilities, says, "Since the opening of this modern plant in 1947, Sinclair RUBILENE® Diesel Lubricating Oil has been the principal oil used. For a short period of time, two prominent competitive brands were tried. However, the daily log and oil samples taken from the engines showed the merits of Sinclair over the other two – *cleaner* engines and *less* oil consumption."

As a result, this plant now uses Sinclair *exclusively*.

SINCLAIR DIESEL LUBRICANTS save wear and replacement.

For more details about Sinclair Diesel Lubricants – *and what they can do for you* – phone or write your local Sinclair representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

Ask Yourself:

1 ***Do we have hand operations that could be mechanized?***

2 ***Is inferior mechanization hampering any operation?***

3 ***Can we use a greater degree of automatic control?***

4 ***Could we combine several operations into a continuous process?***

If your answer is yes, then you are not producing as fast and efficiently as you can

. . . and the immediate importance of your answer is this: from now on, your success as a manufacturer will depend more and more upon the degree of mechanization in your plant.

Too often, today, advances in mechanization are confined to breaking a production bottleneck, or matching a competitive process.

Let's look a bit further—at replacing these sporadic improvements with a *planned* mechanization program.

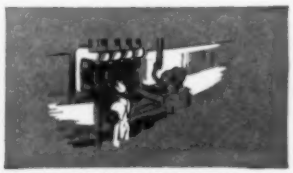
The results are cumulative. Progressively, each operation is lifted to a higher level of mechanization on a sound economic schedule.

You are insured against tomorrow's competition. Manpower and scarce materials are conserved. Your profit position is strengthened.

To help you plan your mechanization, General Electric offers a new guide. We call it "Progressive Mechanization." It's a "More Power to America" program—another way to increase industrial productivity by spreading the knowledge of modern industrial techniques.

HERE ARE THE FOUR STAGES OF PROGRESSIVE MECHANIZATION

1 Simple Mechanization—simple machines driven by power—like this electric tool.

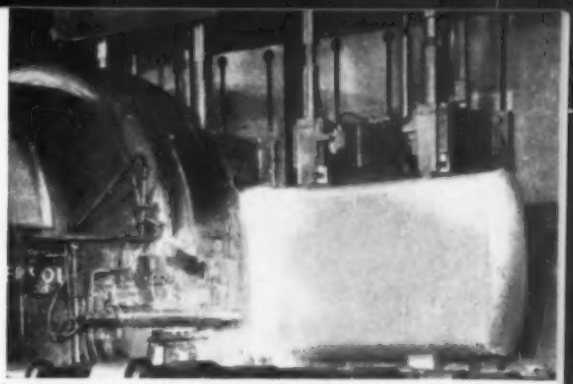


2 Improved Mechanization—more complex, like this drilling machine. Motors and controls aid manual operations.

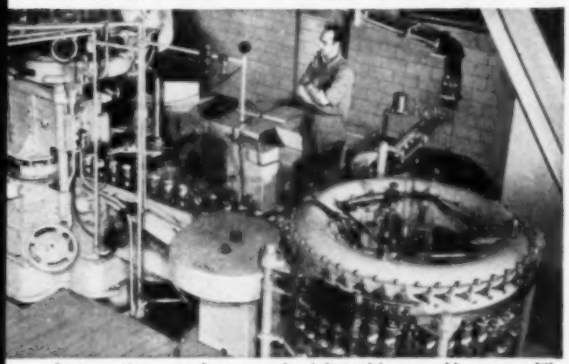
3 Automatic Control—machines that have adjustable-speed with "push-button control," like an automatic welder.

4 Continuous Process—machines co-ordinated for "start-to-finish" production.

Simple mechanization—example: Lightweight electric impact tool tightens nuts in 1/10 the time a hand wrench takes.



Improved mechanization—example: Special milling machine replaces lighter type—"scalps" aluminum billets 5' wide 10' long.



Automatic control—example: Adjustable-speed beer-can filling machine will change rate of production to meet any condition.

Continuous process—example: 216 operations are made on cylinder block in 36 seconds by automatic-transfer-type machine.

How you can improve production in your plant with the G-E Progressive Mechanization Program

START OFF with a "launching ceremony"—have all of your engineers and key people see the full-color movie "Motors in Industry." You'll drive home to them the importance of improving mechanization in your plant.

This informative film has more than 40 interesting mechanization case histories. Shots from four of them are pictured above. They are just a few of the examples that you can use to stimulate interest in mechanizing *progressively*.

CHANNEL THIS INTEREST—do some practical, organized probing into your present production methods. General Electric's Progressive Mechanization manual may help show you the way. Hand out the special mechanization survey forms. You can use them to enlist the participation of as many persons as you wish, including the men "at the bench."

WANT TO LEARN MORE? You get a free copy of the Progressive Mechanization manual, and indicate interest in seeing "Motors in Industry," just by sending in the coupon below. Or contact your nearest G-E Apparatus Sales Office.

GENERAL ELECTRIC

Back up your Mechanization Program with the G-E Motor Selection Course

Here's a complete course, covering the fundamentals of motors now available. It explains how to select and supply motors, what sort of control to use. Your local G-E representative can make arrangements for you to use this course.

MORE POWER TO AMERICA programs are guides to increase the efficiency of American Industry. They stimulate wider, more efficient use of electricity in production.

Section Q732-14
General Electric Co., Schenectady 5, N. Y.

I'd like to learn more about the new G-E Progressive Mechanization program.
I'm interested in:

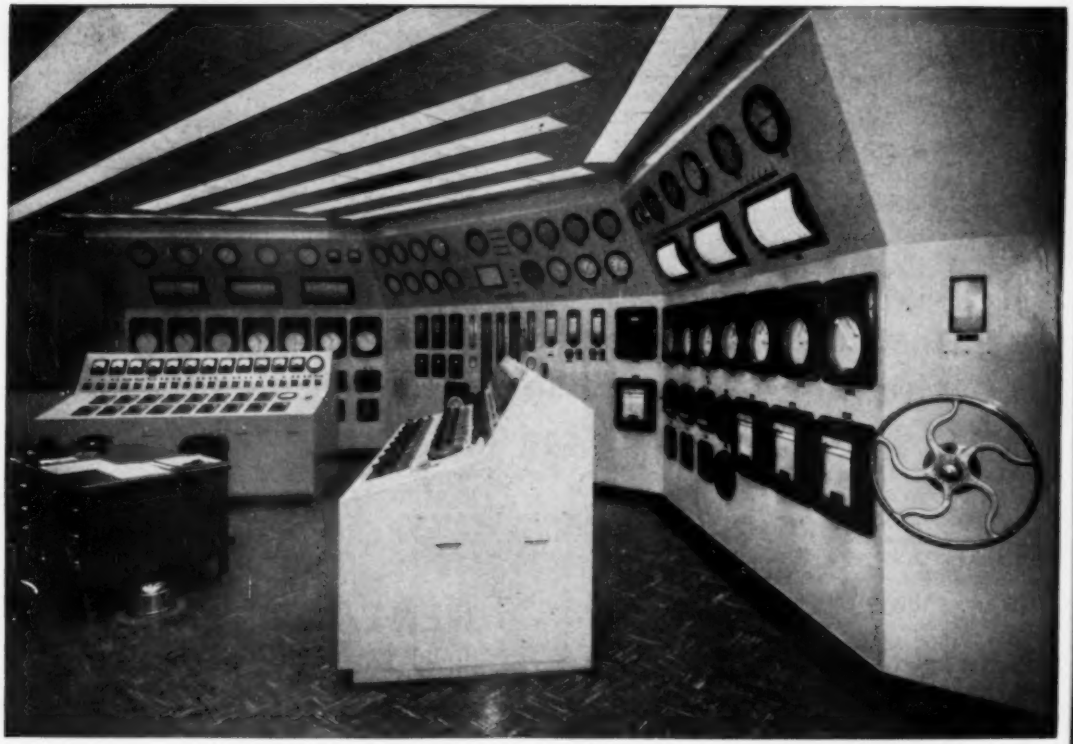
- ☐ A free copy of the Progressive Mechanization manual.
- ☐ Seeing the motion picture on Progressive Mechanization.
- ☐ Using the "Motor Selection & Application Course."

Name ..... **Title** .....

Company .....

Address .....

What's YOUR Fuel-dollar



This Centralized Boiler Control Room insures high efficiency in the use of Fuel-dollars at the Mustang Station of Oklahoma Gas and Electric Company. It includes Bailey Meter Combustion Control, Bailey Three-Element Feed Water Control, Bailey Steam Temperature Control, and Bailey Feed Water Pump Recirculating Control for two gas-fired boilers.

Controls for Steam Plants

COMBUSTION • PRESSURE
FEED WATER • LIQUID LEVEL
TEMPERATURE • FEED PUMPS

Efficiency ?

A dollar's worth of fuel has the *same potential* energy, no matter who's boiler it fires. But how much of the energy actually gets converted to a usable form depends on how you operate your boiler.

That's where Bailey Controls can help. And, here's why, we believe, you'll get better fuel-dollar efficiency with Bailey:

1. **Complete Range of Equipment—fully co-ordinated.** You need never worry that a Bailey Engineer's recommendation is slanted in favor of a particular type of equipment, just because he has a limited line to sell—or that Bailey will pass the buck for efficient control; we offer *complete* boiler control systems.

2. **Engineering Service—backed by experience.** No other manufacturer of instruments and controls can offer as broad an experience, based on successful installations involving all types of combustion, flow measurement and automatic control.

3. **Direct Sales-Service—conveniently located near you.** Bailey Meter Company's sales-service engineers are located in more industrial centers than those of any other manufacturer of boiler control systems; you get prompt, experienced service with a minimum of travel time and expense.

For better fuel-dollar efficiency—for more power per fuel-dollar, less outage and safer working conditions, you owe it to yourself to investigate Bailey Controls. Ask a Bailey Engineer to arrange a visit to a nearby Bailey installation. We're proud to stand on our record: "More power to you!"

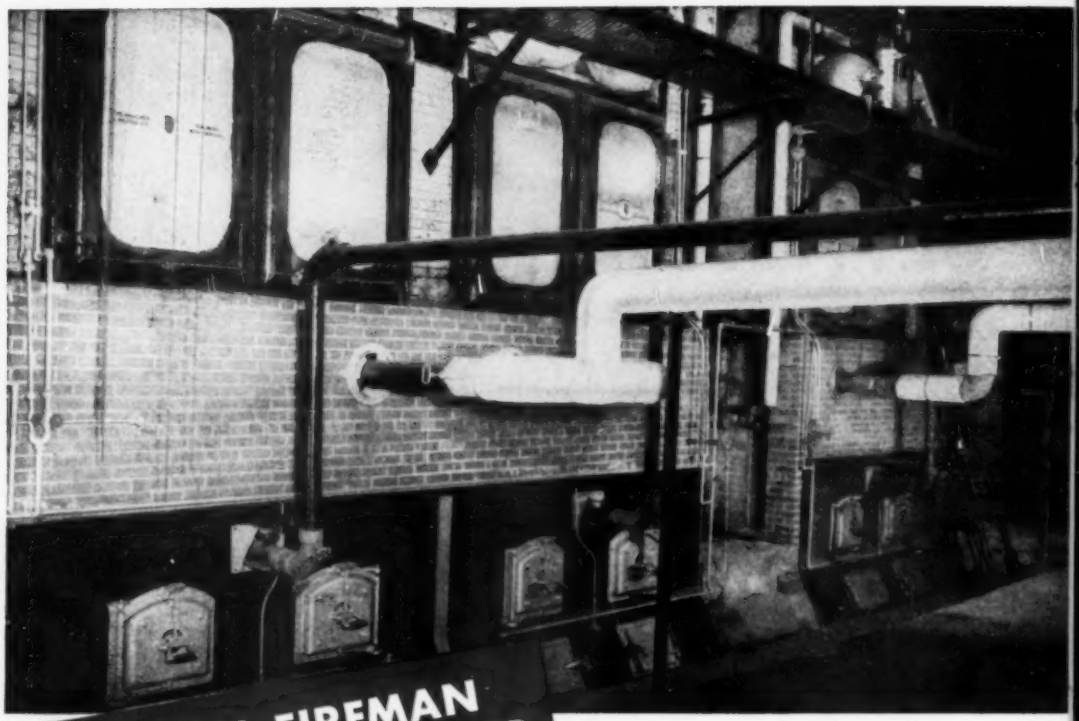
A-109

BAILEY METER COMPANY

1036 IVANHOE ROAD • CLEVELAND 10, OHIO
BAILEY METER COMPANY, LIMITED • MONTREAL, CANADA

BAILEY METERS

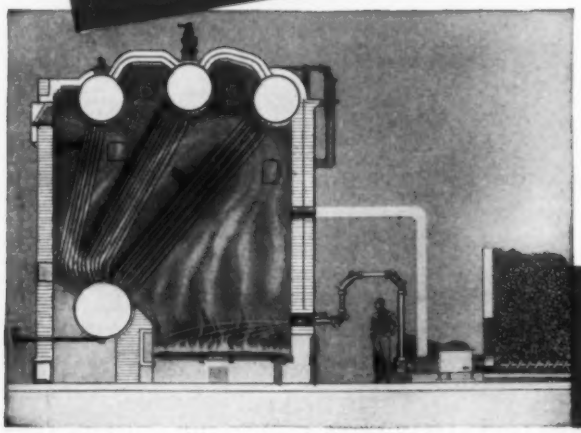
Coal handling and coal firing . . .



IRON FIREMAN PNEUMATIC SPREADER STOKER

CONVEYS DRY COAL ON STREAM OF PRE-HEATED AIR

Coal is thoroughly dried and pre-heated before it is conveyed pneumatically to furnace grates. Dry coal assures far more uniform distribution. The distributor nozzle spreads the dry coal over the *entire* grate in a shallow, uniform fuel bed and not simply on the front of the grate as is usually the case with wet coal. Preheated fines burn in suspension, reducing cinder carry-over and greatly improving combustion efficiency and responsiveness as compared with stokers which do not pre-heat coal.



IRON

. . combined IN ONE UNIT

HANDLES COAL AUTOMATICALLY

Cuts labor and equipment costs

DRIES AND PRE-HEATS COAL

Assures uniform fuel distribution

BURNS ECONOMY COALS

Reduces fuel costs

Burns all grades and types of **BITUMINOUS COAL** from ¼" slack to 2" top size

The Iron Fireman Pneumatic Spreader stoker is more than just a stoker. It is a complete COAL HANDLING AND COMBUSTION SYSTEM. No other stoker combines its many exclusive features and money saving "extras."

Manual coal handling or expensive handling equipment are completely eliminated—and without extra cost. Coal is conveyed pneumatically, direct from bunker or bin to the furnace grates.

The Iron Fireman Pneumatic Spreader stoker burns all grades and sizes of bituminous coals, including low ash fusion, sub-bituminous and lignite—ranging from ¼" slack to 2" top size. In addition, it is ideally adapted to burning the better quality grades of bituminous coal.

Coal is thoroughly dried and pre-heated before it is conveyed to the furnace and distributed over the grates. This assures far more uniform distribution over the *entire* grate.

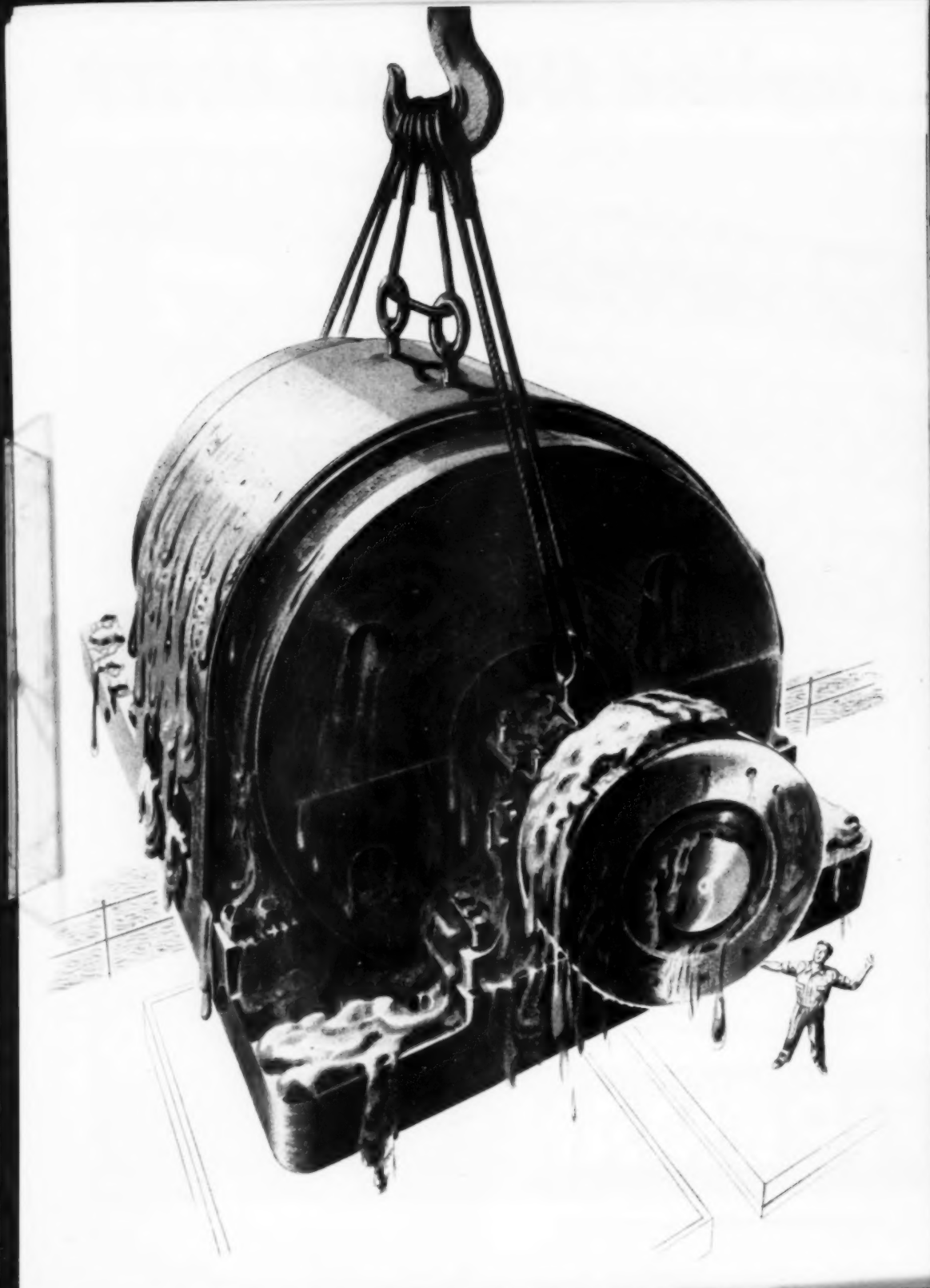
Fuel feed and air volume rate are automatically synchronized. Air supply is kept in step with coal feed-rate at all times. The exclusive Iron Fireman infinitely variable transmission, combined with the Iron Fireman Volumeter, assures maximum efficiency at all rates of operation.

You save in other ways, too. The Iron Fireman Pneumatic Spreader stoker is readily adaptable to any boiler room layout—and without costly alterations. Coal bunkers or bins can be located in almost any position relative to the boilers—even on another level above or below the firing floor. Maintenance costs are low. All moving parts are located away from the direct heat of the combustion chamber. Easy to inspect and service. Capacities available to 1,000 boiler horsepower in single units. Multiple units for larger capacities.

Find out today how Iron Fireman firing will cut fuel and labor costs in your boiler room. A survey in your plant, made without cost or obligation to you, will show you. For such a survey, or descriptive literature, write Iron Fireman Mfg. Co., 3255 W. 106th St., Cleveland 11, Ohio, or call your nearest Iron Fireman dealer.

FIREMAN

COAL, GAS, OIL FIRING FOR POWER, HEATING OR PROCESSING



A nontechnical report to management concerning profits

They did what you can do to save money

One way to save money is to restore damaged equipment to useful service.

This mid-west dredging concern licked such a problem by salvaging two 1500 h.p. synchronous motors and related electrical equipment that had spent three months in 60 feet of Mississippi mud and water.

They turned to Westinghouse Certified Maintenance for help.
In their opinion: "Westinghouse is the only manufacturer with maintenance experience and repair facilities extensive enough to handle such an operation."

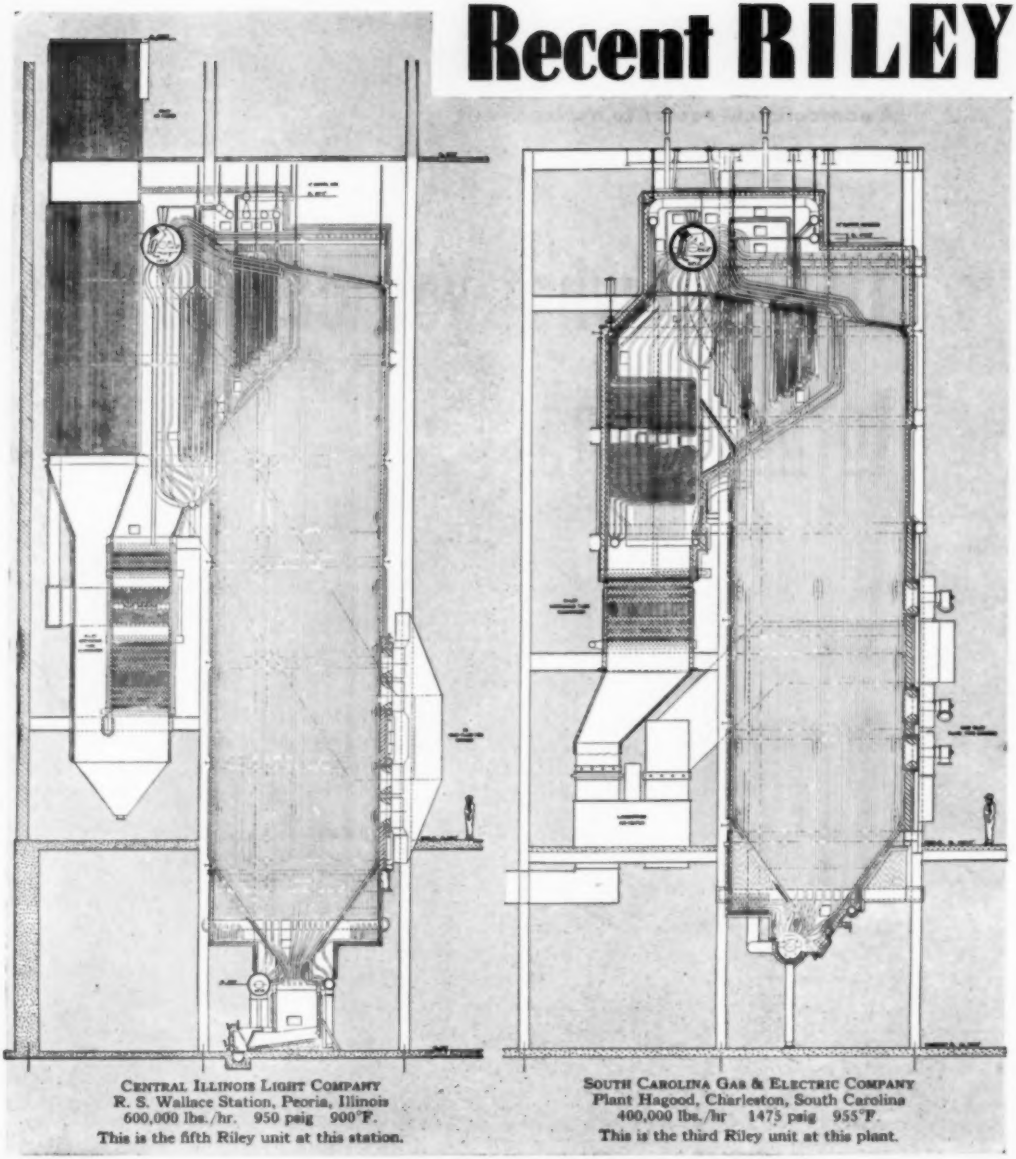
Rebuilding the motor including the switching was the task assigned to our St. Louis Manufacturing and Repair Shop. They renovated it at a substantial savings in time and money to the dredging company.

This same equipment-saving and renewing technique applies to every industry, every maintenance problem. It is a part of the total Westinghouse services which you can use to your profit . . . for application, installation, disaster and emergency or periodic maintenance.

We want to do the kind of planning with you that will apply this Certified Maintenance service . . . to save time, to save money, to make money, to produce more with what you have. Your nearest Westinghouse office can show you how. Westinghouse Electric Corporation, Pittsburgh, Pennsylvania.

YOU CAN BE SURE... IF IT'S
Westinghouse

Recent RILEY



CENTRAL ILLINOIS LIGHT COMPANY
R. S. Wallace Station, Peoria, Illinois
600,000 lbs./hr. 950 psig 900°F.
This is the fifth Riley unit at this station.

SOUTH CAROLINA GAS & ELECTRIC COMPANY
Plant Hagood, Charleston, South Carolina
400,000 lbs./hr 1475 psig 955°F.
This is the third Riley unit at this plant.

TRADE MARK Rx REGISTERED

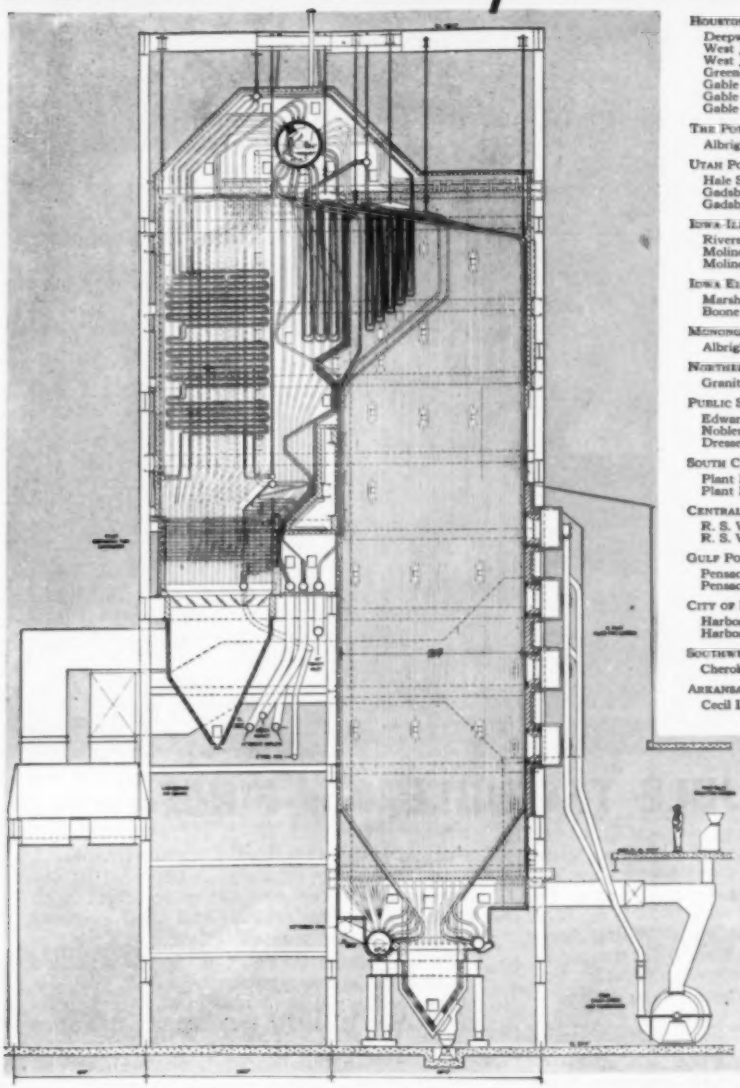
RILEY

STOKER CORPORATION, WORCESTER, MASS.

Boston Cincinnati New York Charlotte Philadelphia Atlanta Denver Washington New Orleans Salt Lake City Buffalo St. Louis Los Angeles Pittsburgh Kansas City Portland Cleveland St. Paul Seattle Detroit Tulsa Chicago Houston

BOILERS • PULVERIZERS • BURNERS • STOKERS • SUPERHEATERS • ECONOMIZERS

Public Utility Installations



Houston Lighting & Power Company

Deepwater Station	1—	1,300,000 lbs./hr.
West Junction Station	3—	825,000 lbs./hr.
West Junction Station	2—	400,000 lbs./hr.
Greens Bayou Station	3—	675,000 lbs./hr.
Gable Street Station	1—	350,000 lbs./hr.
Gable Street Station	1—	250,000 lbs./hr.
Gable Street Station	1—	140,000 lbs./hr.

The Potomac Edison Company

Albright Station	1—	700,000 lbs./hr.

Utah Power & Light Company

Hale Station	1—	450,000 lbs./hr
Gadsby Station	1—	620,000 lbs./hr.
Gadsby Station	1—	575,000 lbs./hr.

Iowa Illinois Gas & Electric Company

Riverside Station	3—	250,000 lbs./hr.
Moline Station	1—	250,000 lbs./hr.
Moline Station	2—	300,000 lbs./hr.

Iowa Electric Light & Power Company

Marshalltown Station	2—	300,000 lbs./hr.
Boone Station	1—	275,000 lbs./hr.

Monongahela Power Company

Albright Station	1—	700,000 lbs./hr.

Northern States Power Company

Granite Falls Station	1—	385,000 lbs./hr.

Public Service Company of Indiana

Edwardsport Station	3—	400,000 lbs./hr.
Noblesville Station	3—	300,000 lbs./hr.
Dresser Station	1—	300,000 lbs./hr.

South Carolina Gas & Electric Company

Plant Hagood	1—	400,000 lbs./hr.
Plant Hagood	2—	230,000 lbs./hr.

Central Illinois Light Company

R. S. Wallace Station	1—	600,000 lbs./hr.
R. S. Wallace Station	4—	300,000 lbs./hr.

Gulf Power Company

Pensacola Station	1—	325,000 lbs./hr.
Pensacola Station	2—	230,000 lbs./hr.

City of Los Angeles

Harbor Steam Station	3—	825,000 lbs./hr.
Harbor Steam Station	2—	675,000 lbs./hr.

Southwestern Gas & Electric Company

Cherokee—Texas	1—	630,000 lbs./hr.

Arkansas Power & Light Company

Cecil Lynch Station	1—	650,000 lbs./hr.

Utah Power & Light Company
Gadsby Station
Salt Lake City, Utah
575,000 lbs./hr. 1700 psig
1000°F. Reheat 1000°F.

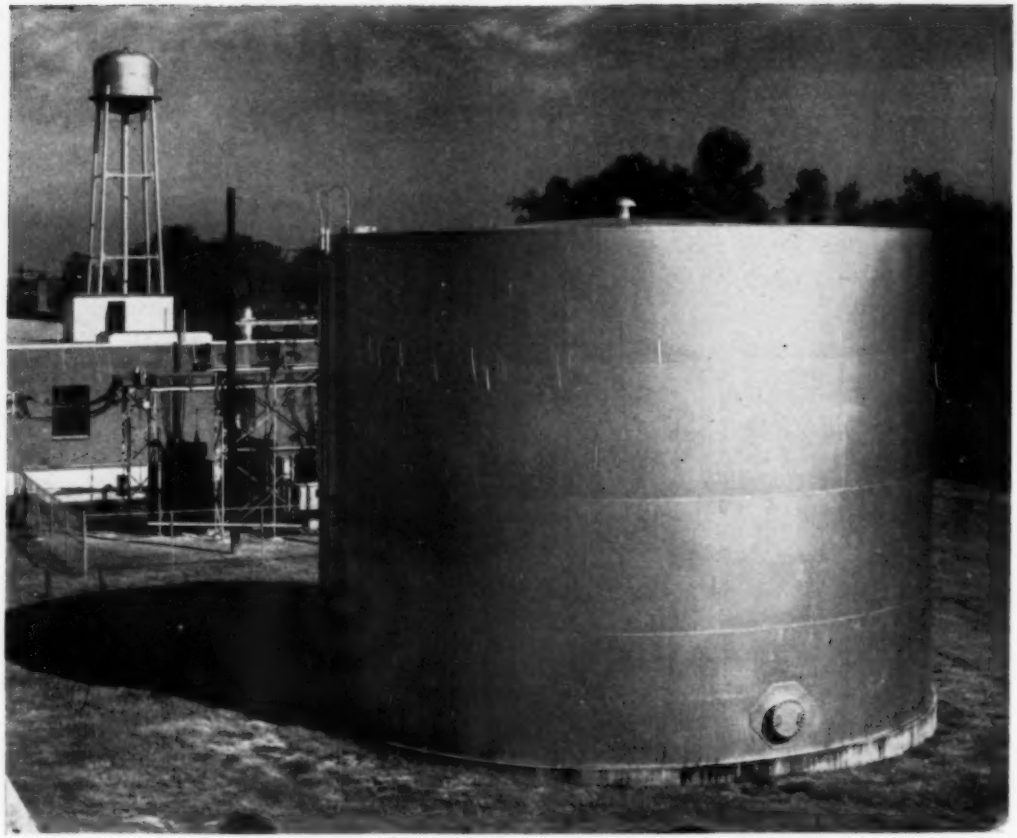
This is the second Riley unit at this station. Utah Power & Light Co. have ordered five Riley units.

A survey of your Power Plant by a consulting engineer will possibly show ways of making surprisingly large savings in your power costs

COMPLETE STEAM GENERATING UNITS

. . . it will pay you to visit modern Riley Installations before purchasing Boiler or Fuel Burning Equipment

WATER-COOLED FURNACES • STEEL-CLAD INSULATED SETTINGS • AIR HEATERS



"DOUBLE TROUBLE" for FIRES

The 350,000-gallon Horton flat-bottom suction tank in the foreground of the above view and the 100,000-gallon Horton elevated tank in the background provide *real* double trouble for fires. Located at the Maverick Mills' White Horse Mill, in Greenville, South Carolina, they supply water to an automatic sprinkler system that protects 416,000 square feet of floor space.

Approximately in the center of 125 acres, about 6 miles south of Greenville, the White Horse Mill is designed for a complete operation to produce combed fabrics. Starting with the raw cotton, the fibers are combed, spun and processed until finally they emerge as grey cloth.

The entire mill is protected by automatic sprinklers installed by the Daniel Construction Company. A dependable gravity water supply is provided by the Horton elevated tank. A secondary supply of water is provided by the suction tank. The two tanks are filled with water from artesian wells and their contents are held in reserve at all times.

Horton welded steel suction tanks and Horton elevated tanks are serving industries throughout the country. Dependable elevated tank gravity pressure is ideally seconded by the suction tank as in the operation above, or either tank may be used singly depending upon requirements.

Horton ellipsoidal-bottom elevated tanks are built in standard capacities from 15 000 to 500,000 gallons. Welded steel suction tanks are available in standard sizes from 50,000 to 500,000 gallons. Further information may be had by writing our nearest office.

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3.....2180 Healey Bldg.
Birmingham 1.....1731 North Fiftieth St.
Boston 10.....1044—201 Devonshire St.
Chicago 4.....2107 McCormick Bldg.
Cleveland 15.....2218 Guildhall Bldg.
Detroit 26.....1534 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston 2.....2132 C & I Life Bldg.
Los Angeles 17...1545 General Petroleum Bldg.
New York 6.....3312—165 Broadway Bldg.
Philadelphia 3....1646—1700 Walnut St. Bldg.
San Francisco 4.....1521—200 Bush St.
Seattle 1.....134 Henry Bldg.
Tulsa 3.....1628 Hunt Bldg.
Washington 6, D. C.....1114 Cafritz Bldg.

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, *and* GREENVILLE, PA. *In Canada*—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

THESE 3 NON-METALLIC DISCS

can save you hundreds of valve dollars

Lunkenheimer "N-M-D" (Non-Metallic-Disc) Valves save you maintenance time and replacement money. Each disc is compounded for a special service — and all are easily interchanged or replaced. You're sure of the *right* valve for the job when you stock Lunkenheimer "N-M-D's."

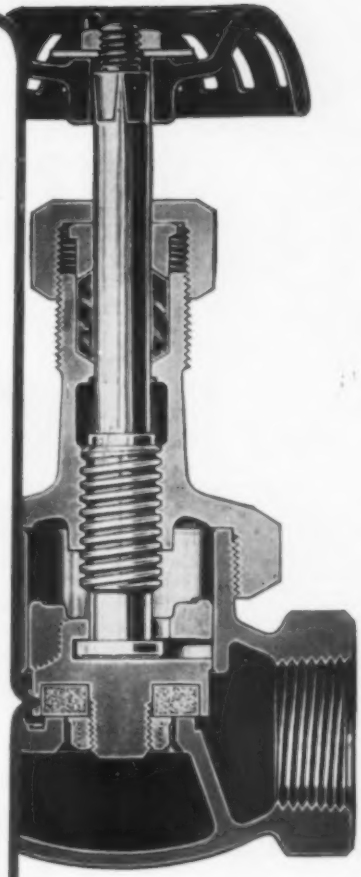
LUNKENHEIMER "N-M-D" Valves with No. 20 Discs handle 150 lb. saturated steam and hot water at pressures up to 300 lbs. and temperatures to 150°F. No. 20 Discs are designed for use on all Lunkenheimer "N-M-D" Globe, Angle, Check, and Quick Operating Valves where hot fluids are handled.

★

LUNKENHEIMER "N-M-D" Valves with No. 30 Discs are recommended especially for cold water, air, and gas service at pressures to 300 lbs. All Lunkenheimer "N-M-D" Valves can be converted from one service to another simply by exchanging the discs, which are identical in size and shape.

★

LUNKENHEIMER "N-M-D" Valves with No. 50 Discs are ideal for gasoline, oil, butane, and propane service. Disc-Holder for all "N-M-D" Valves is the slip-on type—four long guides prevent "cocking" and assure perfect disc seating. All three discs can be replaced or exchanged quickly.



WRITE FOR Circular 558, which includes complete details, dimensions, and service recommendations. It is available from your distributor or from The Lunkenheimer Co., Box 360EE, Cincinnati 14, Ohio.

BRONZE • IRON • STEEL

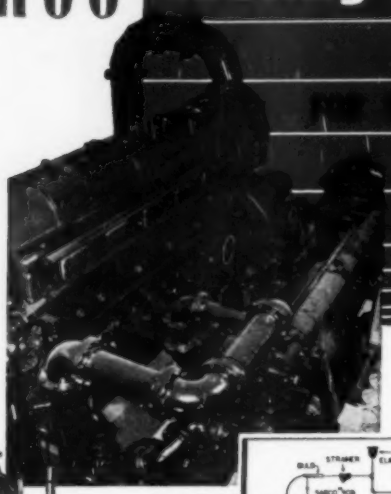
★ See our exhibit, Booth 52, at the 20th National Power Show, Grand Central Palace, N. Y., December 1 to 6, 1952.

L-892-4

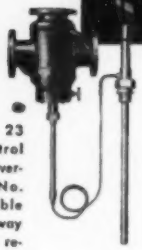
LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

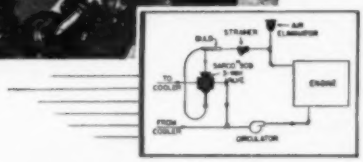
SARCO cooling controls



Two 4" Sarco, type 23-509M Cooling Controls on Fairbanks-Morse Diesel engine at Seaford Light and Power Co., Seaford, Del.



Sarco type 23 Cooling Control with 3-way diversion valve No. 509M. Available also with 2-way piston valves, reverse or direct acting (by-pass control), in sizes ½" to 6".



Hook-up for engine jacket control using Sarco type 23 regulator with 3-way valve to recirculate a varying portion of the cooling water.

Sarco type 13W Air Eliminators prevent air pockets in water lines.

Sarco Pipe Line Strainer.

SARCO offers a complete line of self-operated Temperature Regulators for use on internal combustion engines for stationary, marine and locomotive application.

Their distinguishing feature is the use of

Liquid Expansion Thermostatic Systems . . .

In these systems, the thermostat bulb, connecting tubing and valve-closing element are completely filled with mineral oil.

Expansion of this oil, when heated, pushes forward a plunger in contact with the valve discs, thus positioning the valve.

Since the valves are double-seated and fully balanced, they can float on the line, providing gently throttling control.

The power for moving the valve is uniform per degree temperature rise at any point of the scale.

Sarco regulators are not limited to standard ranges. Each regulator is factory set for the exact operating temperature desired. It can then be adjusted by the user both higher and lower as required.

Sarco controls are built with packless seals eliminating the necessity of replacing packing from time to time.

Write for Sales Sheet No. S1429.

363

SARCO COMPANY, INC.

EMPIRE STATE BUILDING, NEW YORK 1, N. Y.

SARCO CANADA LTD., TORONTO 8, ONTARIO

REPRESENTED IN PRINCIPAL CITIES

TNEMEC PRIMERS KILL RUST!

THE first step in preserving steel with paint is applying the prime coat. Its primary job is to prevent and kill rust action. TNEMEC Primers do just that, by creating a neutral condition on steel surfaces, changing active rust and corrosive agents into an inactive neutral compound.

The second step is applying the finish coat that will provide protection against the specific exposure hazards involved.

WHAT IS YOUR EXPOSURE HAZARD?

Is it the humid, salt-air atmosphere of coastal areas? Is it the acid-laden atmosphere found in and around industrial plants, refineries, steel mills, the processing industries, etc? Is it submersion in sewage treating vats, in salt brine, or in fresh water tanks?

No matter what your problem is, there is a TNEMEC Finish Coat to solve it. And remember . . . you will always save many maintenance dollars by doing the job *right*.

Ask Any TNEMEC User
(TEE-NEE-MIX)

MAIL THIS COUPON FOR YOUR COPY OF TNEMEC CATALOG 50

SEE OUR CATALOG IN SWEET'S

TNEMEC COMPANY, INC.

TNEMEC COMPANY, INC.
131 W. 23rd Ave., North Kansas City, Missouri

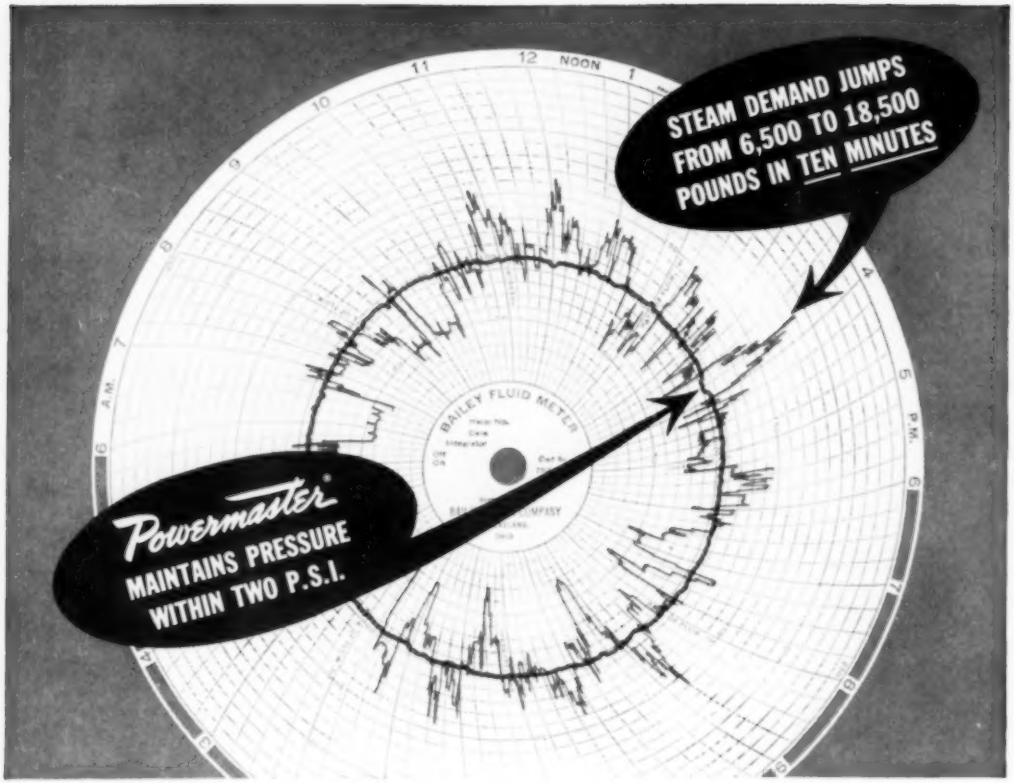
Gentlemen:
Send my copy of your Catalog 50 to:

NAME _____

FIRM NAME _____

ADDRESS _____

CITY _____ ZONE ___ STATE _____



Performance records prove *Powermaster's* VORIFLOW combustion responds immediately to steam demand . . . and at full efficiency

At a large southern cotton mill, two 300 h.p. POWERMASTER boilers are generating steam 'round-the-clock at a constant pressure of 100 p.s.i. Note how evenly this pressure (blue line on chart) was maintained even though steam demand (red line) varied from a low of 3,000 pounds per hour to a high of more than 18,500. Between 3:30 P.M. and 3:40 P.M. the load nearly tripled . . . but the POWERMASTERS responded immediately with insignificant pressure change and no "hunting".

This kind of performance is possible because of POWERMASTER's exclusive VORIFLOW combustion. Here's what it will do for you:

1. Saves fuel by providing infinitely variable combustion modulation in response to demand—with *full efficiency*—through wide range from 30% to 100% of firing capacity.

This means elimination of waste and maintenance headaches because of incomplete combustion. The VORIFLOW air-atomizing oil burner does away with outmoded mechanical spinning devices, globules of wasted oil, and gummy cleaning problems. The VORIFLOW gas burner is an O&S pre-mix design equally efficient at all firing rates between 30% and 100% loads.

2. Slashes boiler maintenance costs.

The burner has *no* moving parts to wear out • There is *no* cup to clean daily • Routine cleaning of the burner once a month is sufficient • There is *no* burner vibration to throw adjustments "out of whack" • Parts are made of stainless steel, brass, and beryllium copper—they will last indefinitely.

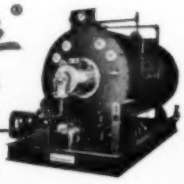
3. The combination burner permits rapid change-over from one fuel to another—light oil, heavy oil, or gas.

Before deciding on a boiler for your plant, be sure to get the facts on the newest POWERMASTER with VORIFLOW combustion. Write for this catalog that gives you the entire story of the *Powermaster* packaged automatic boiler. Just drop us a line and we'll put one in the mail for you.

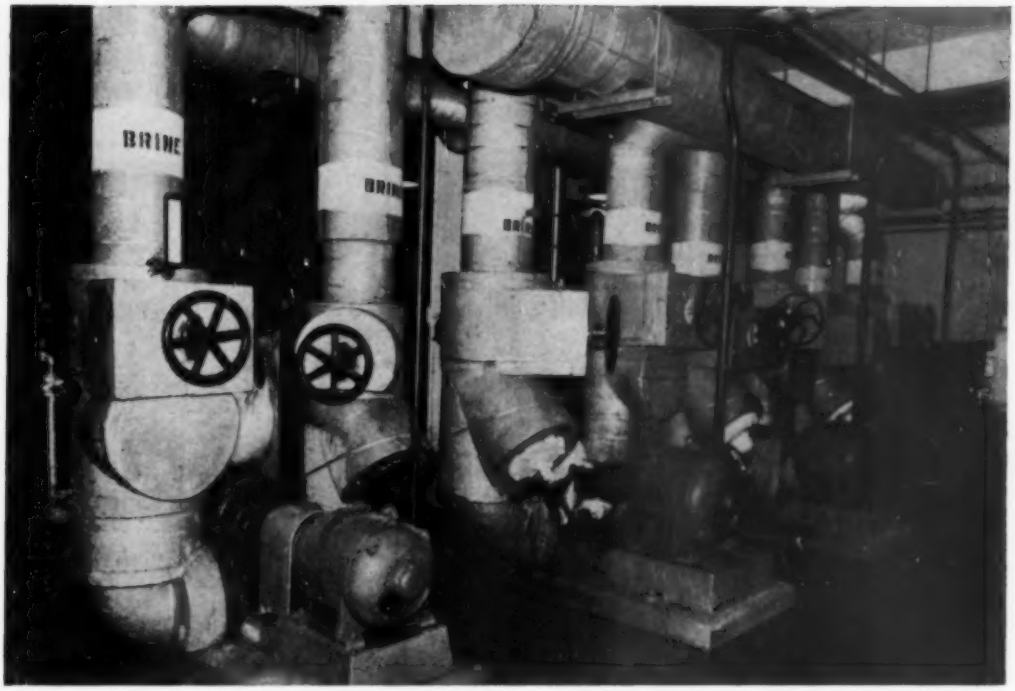
Powermaster®

PACKAGED AUTOMATIC BOILERS

In sizes to 500 HP; pressures to 250 psi.



ORR & SEMBOWER, INC. • Established 1885 • **910 Morgantown Road, Reading, Pennsylvania**



They couldn't take a chance with these brine lines—

...so they insulated with FOAMGLAS!

● Condensation could make short work of ordinary insulation on these 0°F. brine lines. So, to eliminate the fuss and *high cost* of replacing ruined insulation, American Cyanamid Company chose FOAMGLAS for the indoor brine lines and coolers shown here.

Even without a protective coating of any kind, FOAMGLAS resists water and will not transmit vapor under these service conditions. And, since it is a 100% glass product—no organic binders or fillers—FOAMGLAS is unaffected by all ordinary chemicals, it furnishes no food for vermin, and it will not burn.

The high insulating efficiency of FOAMGLAS is caused by unique cellular construction. Every rigid block of FOAMGLAS contains millions of tiny, isolated air cells; each air cell completely surrounded by glass.

In other words, with FOAMGLAS, you have a *material* that is inert—glass, combined with cellular construction—the most efficient *form* of insulation.

It's an unbeatable combination of properties if you want an insulation that you can install and *forget*.

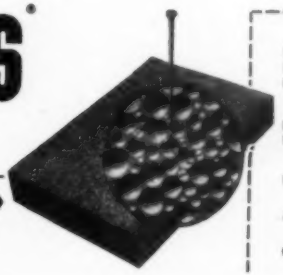
PITTSBURGH CORNING CORPORATION · PITTSBURGH 22, PA.

PITTSBURGH PC CORNING

FOAMGLAS®

the cellular glass insulation

The *best* glass insulation is cellular glass. The *only* cellular glass insulation is FOAMGLAS. This unique material is composed of still air, sealed in minute glass cells. It is light weight, incombustible, verminproof. It has unusually high resistance to moisture, chemicals and many other elements that cause insulation to deteriorate.



Pittsburgh Corning Corporation
Dept. AE-102, 307 Fourth Avenue
Pittsburgh 22, Pa.

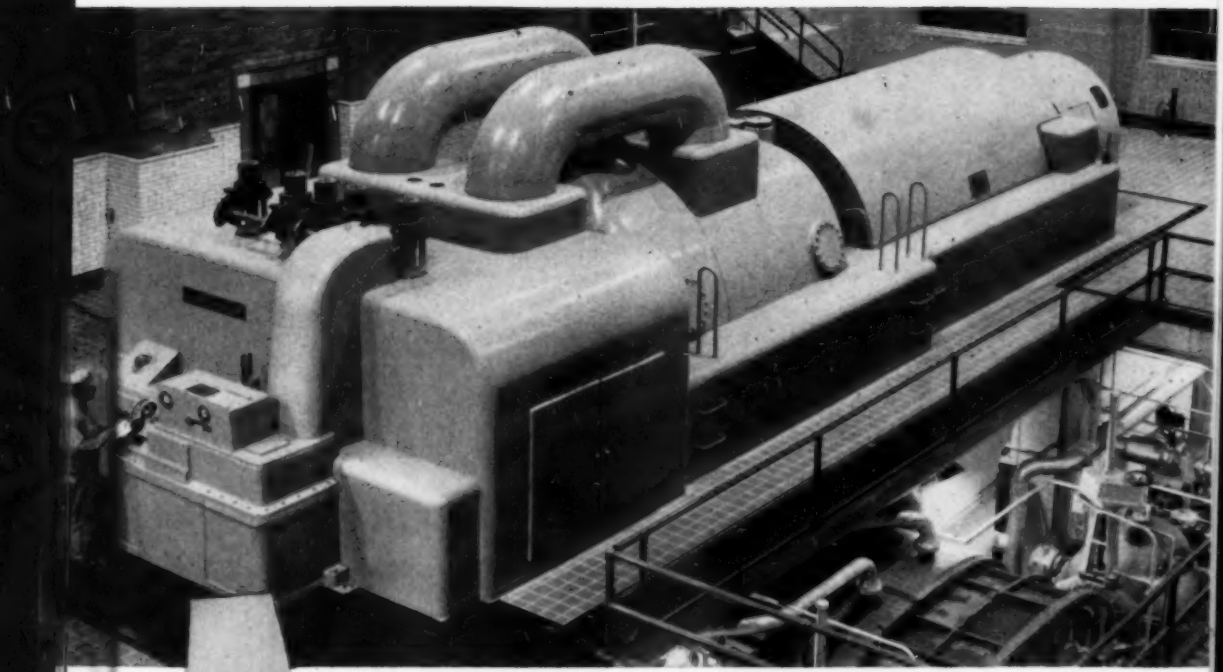
Please send me, without obligation, a sample of FOAMGLAS and your FREE booklet on the use of FOAMGLAS for Piping and Process Equipment.

Name .....

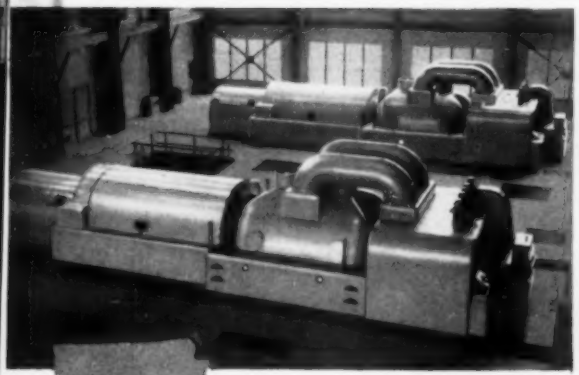
Address .....

City ..... State .....

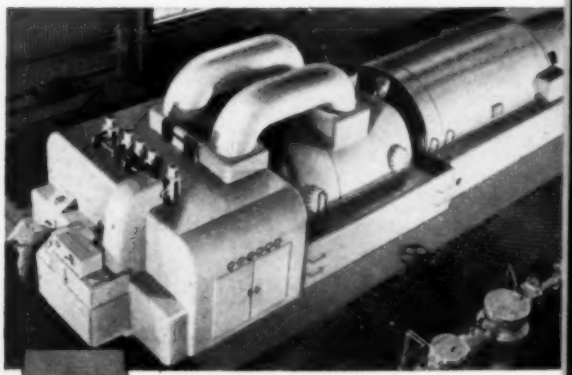
POWER for the



ALABAMA area has experienced an industrial power consumption rise of over 12½% in one year's time. To help meet this rocketing power demand, the Alabama Power Company just recently installed this Allis-Chalmers 40,000 kw steam turbine hydrogen cooled generating unit at its Chickasaw station in Mobile. A-C also supplied the 30,000 sq ft surface condenser and its auxiliaries, including two 25,000 gpm circulating pumps and motors.



ARKANSAS has the largest U. S. deposit of bauxite ore, primary to the production of aluminum. These two Allis-Chalmers 40,000 kw condensing, tandem compound steam turbine hydrogen cooled generating units form the Lake Catherine steam-electric station of the Arkansas Power & Light Company. Most of this power is used to electrolytically reduce alumina.



LOUISIANA industry and agriculture are mushrooming. The Gulf States Utilities Company — serving an area from Baton Rouge to across the Brazos River in Texas—has doubled its customers and tripled its power generation in the last decade. A-C recently supplied 75,000 kw in generating capacity to Riverside station near port city of Lake Charles. Unit shown is 40,000 kw.

Booming South!

NEW ALLIS-CHALMERS TURBINE-GENERATORS HELP SUPPLY MUSHROOMING INDUSTRIAL DEMAND

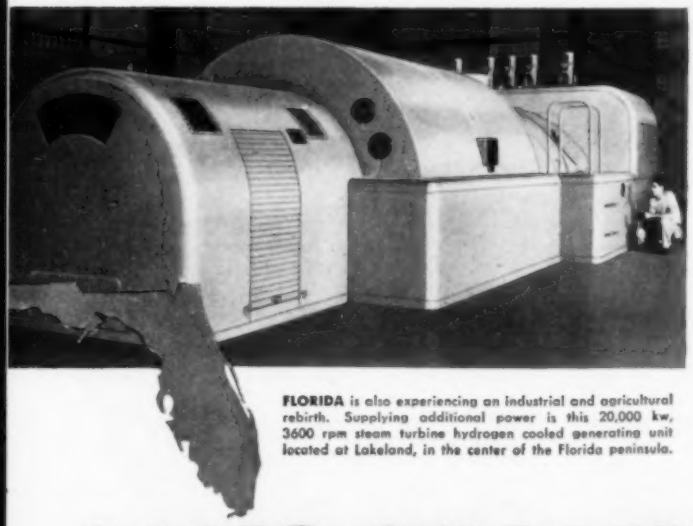
YOU'VE HEARD OF the South's mushrooming industrial growth. Here are some of the Allis-Chalmers steam turbine generator units newly installed to help satisfy that insistent power demand.

All these modern units conform to AIEE-ASME preferred standards in addition to incorporating many exclusive Allis-Chalmers main design features. The hydrogen cooled generators all have the A-C originated "walk-in" exciter housings. And these 3600 rpm turbines all have the following outstanding features.

Hydraulic control and operation with accessible placement of main stop valve; centralized grouping of operating controls; cam-operated inlet valves accessibly located on top of cylinder; and exclusive A-C method of temperature compensation for horizontal *and* vertical thermal movement.

All oil piping is above the floor, simplifying foundation and installation. And, as throughout the complete Allis-Chalmers line—ranging from the smallest single cylinder machines to single shaft, tandem compound, condensing units of 150,000 kw — labyrinth steam seals are used. The steam sealed gland system is self-contained and provides dependability with minimum attention.

You get the real design advances *first* from Allis-Chalmers. When planning the installation or expansion of your steam-electric power plant, let A-C simplify your problem. This *one* source will provide you with the world's widest range of power plant equipment. For your copies of literature on all products mentioned, call your nearest A-C office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3842



FLORIDA is also experiencing an industrial and agricultural rebirth. Supplying additional power is this 20,000 kw, 3600 rpm steam turbine hydrogen cooled generating unit located at Lakeland, in the center of the Florida peninsula.

ALLIS-CHALMERS *firsts*

Simplified hydrogen seal and control

World's lowest exhaust pressure steam turbines

Solidly-bolted-down steam end pedestal

Turbine for one-boiler-per-turbine arrangement

"Walk-in" exciter housing

30,000 kw, 825 F turbine, in 1931

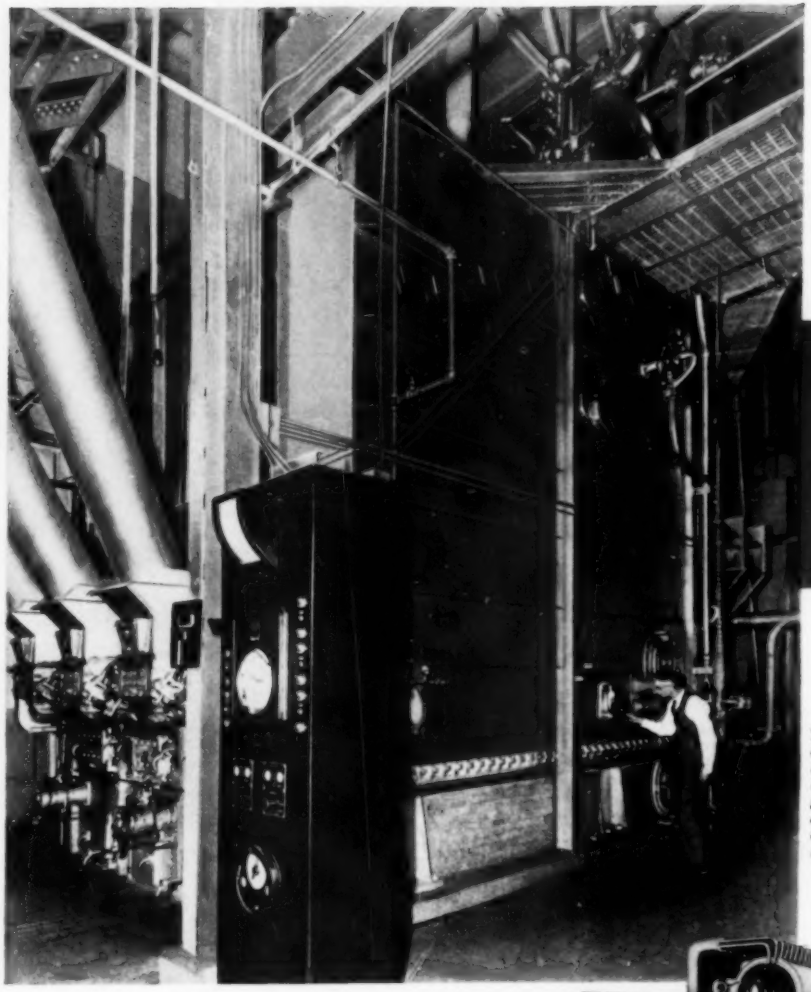
825 F reheat turbine, in 1935

AND NOW...First with supercharged hydrogen cooling!

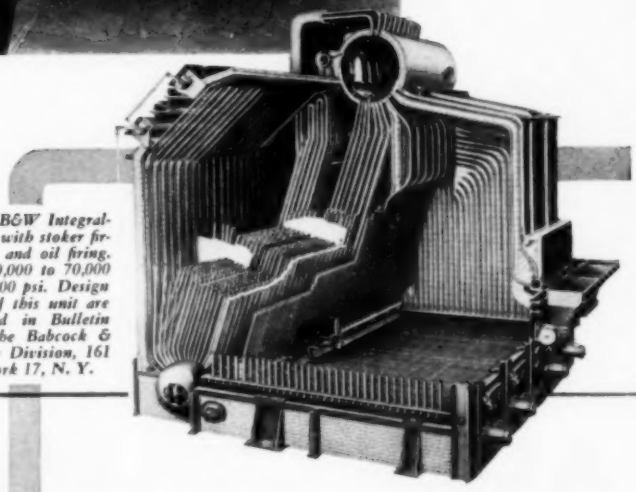
ALLIS-CHALMERS

World's Widest Range of Power Plant Equipment

TURBINES & GENERATORS | CONDENSERS & PUMPS | SWITCHGEAR & BREAKERS | MOTORS & CONTROL | TRANSFORMERS | WATER CONDITIONING



Tom Turner, Chief Engineer of the Buffalo plant of General Mills, Inc. inspects the company's new B&W Integral-Furnace Boiler Type FJ, after verifying metered records of fuel savings exceeding 15 per cent.



Cutaway view of typical B&W Integral-Furnace Boiler, Type FJ, with stoker firing. Also suited for gas and oil firing. Steam capacity range—30,000 to 70,000 lb per hr at pressures to 800 psi. Design and operating features of this unit are described and illustrated in Bulletin G-70, available from The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

GENERAL MILLS

CUTS FUEL BILL

more than 15 per cent

with B&W Integral-Furnace Boiler

When General Mills, Inc., recently placed in operation a B&W stoker-fired Integral-Furnace Boiler at its Buffalo, N. Y. plant, the company immediately realized fuel savings amounting to more than 15 per cent. The new boiler was installed with no heat traps such as air heaters or economizers, so that the fuel savings are due to better boiler performance alone. Smoke nuisance, long a problem at this General Mills plant, has been eliminated by the new unit . . . to the complete satisfaction of company engineers and local authorities.

The General Mills, Inc. consulting engineers made the plans, B&W men did the entire erection and B&W service engineers moved in to start up the boiler, turning over to General Mills a complete and efficient operating unit. Since that day, the B&W Integral-Furnace Boiler, producing 45,000 lb of steam an hr, has operated continuously, and is destined to give General Mills long service at low cost.

You Can Have These

COST SAVING FEATURES

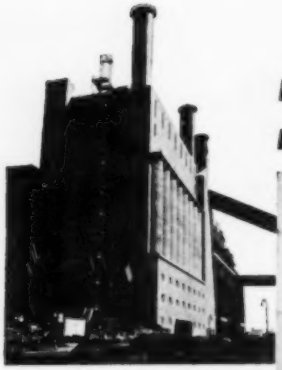
of B&W Integral-Furnace Boilers for Steam Requirements from 2,800 to 350,000 Lb. Per Hr.

- Minimum floor space and headroom requirements
- High fuel economy
- Smokeless combustion
- Adaptable to all fuels and firing methods
- Economical fast steaming
- Water-cooled furnace
- Clean, dry steam at all ratings, even with high boiler water concentration
- Quick response to wide and heavy load swing demands
- Easy to inspect and clean
- High availability with least attention

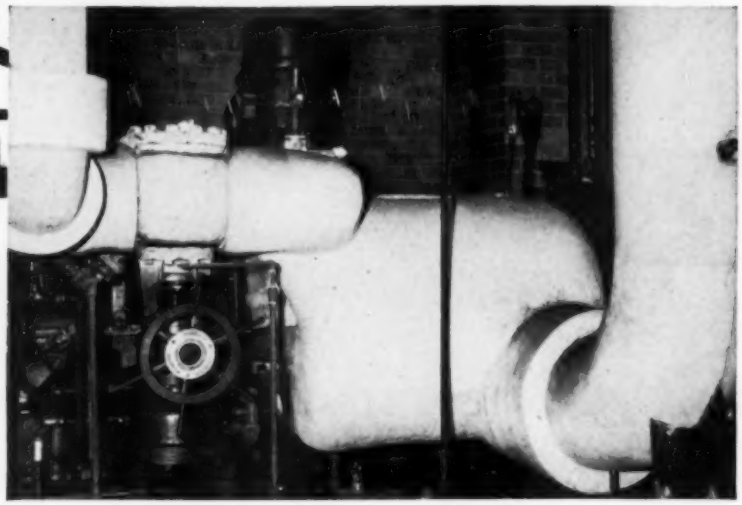
B&W

BABCOCK & WILCOX

G-561



For this new addition to their New York City power plant at East River and 14th Street . . .



(Above) View of recently completed annex to Consolidated Edison's power plant . . . another link in their gigantic expansion program. **(Right)** Close-up of J-M 85% Magnesia Insulation on boiler feed lines. It was expertly installed by the Asbestos Construction Company, Inc., an outstanding J-M Insulation Contractor.

CON EDISON SPECIFIES J-M 85% MAGNESIA PIPE INSULATION FOR MAXIMUM FUEL SAVINGS

Like all materials that went into the new power plant addition of New York's leading gas and electric supplier . . . the pipe insulation had to be the *best*. That's why Consolidated Edison Co. specified J-M 85% Magnesia . . . industry's No. 1 insulation for many decades and *still* the leader in its class.

J-M 85% Magnesia is the leading insulation on the market for temperatures up to 600F. It is bonded with asbestos fibers. This rugged insulation will not distort regardless of the length of time it stays in service. J-M 85% Magnesia fits snug and stays put. Heat savings, therefore, remain constant for the life of the equipment on which this insulation is applied.

For temperatures over 600F, J-M 85% Magnesia is used in combination with Superex*, a J-M insulation for service to 1900F. This double-layer construction, known as Superex Combination, eliminates through joints and protects the jacket against scorching. It also utilizes the higher heat resistance of Superex next to the hot surface, and the greater insulating value of J-M 85% Magnesia for the outer layer.

*Reg. U.S. Pat. Off.

Experience has proved that all insulations must be properly installed to pay maximum dividends. That's why Johns-Manville offers industry the services of experienced insulation engineers and installation contractors who have made a career of solving complex insulation problems. From coast to coast, these engineers and the contractor's highly skilled mechanics stand ready to combine their talents and give you an insulation job that will more than pay off your initial investment with maximum fuel savings through the years.

When you face your next insulating problem . . . remember that Johns-Manville is "Insulation Headquarters." Consult your near-by J-M Insulation Contractor . . . or write direct to Johns-Manville, Box 60, New York 16, New York. In Canada, write 199 Bay Street, Toronto 1, Ontario.

Skilled Applicators on the team of a J-M Insulation Contractor applying J-M 85% Magnesia to pipelines. Located throughout the nation, these contractors have had years of experience handling all types of installations. They know J-M 85% Magnesia and other J-M insulations as *quality* products, and take pride in applying them properly. Result: an insulation job that pays dividends through the years in maximum fuel savings.

Johns-Manville *FIRST IN* INSULATION

MATERIALS • ENGINEERING • APPLICATION

HERE'S YOUR PROOF OF . . . .

DRAVO *Counterflo* HEATER VERSATILITY!

get these FREE case studies now!

Detailed information and photographs show how heaters can be adapted for tempering make-up air . . . or how de-fogging of a plant may be accomplished using Dravo Heaters. These case studies give you proof of Dravo Heater versatility, and they're yours for the asking.

DRAVO HEATERS OFFER YOU:

LOW INITIAL COST—Users report 30% to 60% savings over "wet-type" systems.

EASY INSTALLATION—Need only fuel, exhaust and electrical connections . . . no ductwork.

LOW OPERATING COST—Direct-fired . . . burn gas or oil . . . readily converted . . . minimum efficiency 80%.

AUTOMATIC OPERATION—On-off or modulating controls . . . no constant attention needed.

LONG SERVICE LIFE, LOW MAINTENANCE—Stainless steel combustion chamber eliminates refractory lining.

SAFETY—Approved by American Gas Association, listed by Underwriters' Laboratories, Inc.; Dravo standardized safety control circuit accepted by Factory Mutual Engineering Division.

MOBILITY—Can be moved to any location.

FLEXIBILITY—When floor space is limited, can be wall-hung or suspended from trusses in any position.

DRAVO HEATERS SOLVE HEATING PROBLEMS IN THESE INSTALLATIONS, TOO:

- **PROCESS DRYING AND HEAT CURING**—where moisture content must be controlled or removed from air, and temperature regulated to meet production needs.
- **HEATING AND VENTILATING STORES, SCHOOLS, AUDITORIUMS, AND LARGE BUILDING AREAS**—where quick, automatically controlled, low-cost heating is desired.
- **TEMPORARY HEATING**—where comfort heat is necessary during building construction or to keep ground temperature above freezing in winter.

FOR FREE CASE STUDIES OF INTEREST TO YOU

MAIL THIS COUPON TODAY . . .

(Case Study sheets are 8½" x 11", punched for binder or convenient filing.)

HEATING DEPARTMENT, DRAVO CORPORATION
Dravo Building, Fifth and Liberty Avenues
Pittsburgh 22, Pa.

Please send me the following case studies FREE:

- ☐ Process drying and heat curing
- ☐ Space heating large buildings
- ☐ Tempering make-up air
- ☐ Temporary heating
- ☐ Stores, schools and auditoriums
- ☐ Please have a representative call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

When writing ask for Bulletin DE-5

DRAVO
CORPORATION

PITTSBURGH • ATLANTA • BOSTON • CHICAGO • CINCINNATI CLEVELAND • DETROIT • NEW YORK • ST. LOUIS • PHILADELPHIA WASHINGTON

Sales Representatives in Principal Cities

Manufactured and sold in Canada by Marine Industries, Ltd., Sorel, Quebec. Export Associates: Lynch, Wilde & Co., Washington 9, D. C.

These Industrial of Detroit

OF VARIOUS TYPES AND CAPACITIES ARE TYPICAL OF THOUSANDS OF CUSTOMERS. SUCH UNIVERSAL ACCEPTANCE... AND THE LARGE NUMBER OF REPEAT ORDERS ... ARE OVERWHELMING EVIDENCE OF SATISFACTION.

Aluminum Co. of America—9 plants
Allied Chemical & Dye Corp.—4 plants
Abitibi Power & Paper Co. Ltd.—2 plants
Amalgamated Sugar Co.—3 plants
American Crystal Sugar Co.—3 plants
American Steel Foundries
American Tobacco Co.—2 plants
Armour & Co.—4 plants
The Borden Co.—28 plants
Burroughs Adding Mach. Co.—2 plants
Cannon Mills Inc.—10 plants
The Carborundum Co.—3 plants
J. I. Case Co.—5 plants
Chesapeake & Ohio Ry. Co.—7 plants
C. B. & Q. R. R. Co.—4 plants
Chicago & Northwestern R. R.—3 plants
Chrysler Corporation—12 plants
Columbian Carbon Co.—3 plants
Peter Cooper Corporations—4 plants
Crane Co.
Avco Mfg. Corp.
Crosley Division—2 plants
Crosse & Blackwell Co.—2 plants
Crucible Steel Co. of America—2 plants
Cudahy Bros. Co.
Deere & Co.—6 plants
E. I. Dupont de Nemours & Co.—9 plants
The Electric Autolite Co.—14 plants
The Falk Corp.
Firestone Tire & Rubber Co.—6 plants
General Electric Co.—6 plants
General Foods Corp.—3 plants
General Motors Corporation—37 plants
Goodyear Tire & Rubber Co.
Great Lakes Sugar Co.—3 plants
Great Western Sugar Co.—3 plants
Hercules Powder Co.—4 plants
Homestake Mining Co.—9 plants
International Harvester Co.—2 plants
International Shoe Co.—17 plants
Jones & Laughlin Steel Corp.
Spencer Kellog & Sons Inc.—6 plants
Koppers Co. Inc.—2 plants
Lever Bros. Ltd.
Libby, McNeill & Libby—3 plants
Libbey-Owens-Ford Glass Co.—3 plants
Liggett & Meyers Tobacco Co.—2 plants
Eli Lilly & Co.—2 plants
Marshall Field & Co.—3 plants
Michigan Sugar Co.—6 plants
Minnesota Mining & Mfg. Co.—4 plants
Minneapolis-Moline Co.—2 plants
Monsanto Chemical Co.—3 plants
Nash-Kelvinator Corp.—2 plants
National Dairy Prod. Corp.—12 plants
Nestle Co., Inc.—4 plants
New York Central System—14 plants
Pacific Mills—3 plants
Pittsburgh Plate Glass Co.—3 plants
Pullman Inc.—5 plants

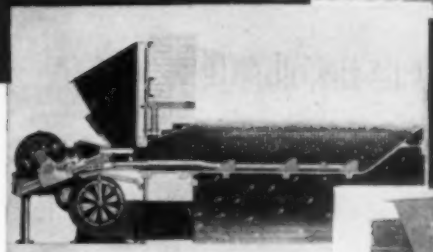
WHY NOT LET US REDUCE YOUR STEAM COST?

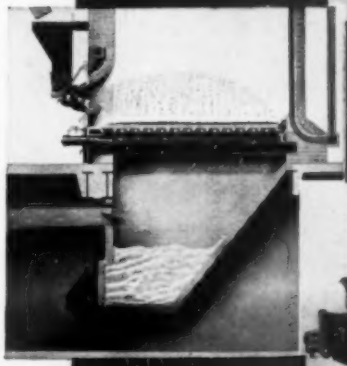
An informal discussion with one of our Engineers will cost you nothing and might save you a lot. Write us today.

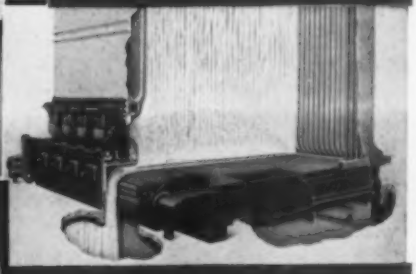
DETROIT SINCE 1898 STOKERS

Users Stokers

THERE IS A TYPE AND SIZE OF DETROIT STOKER FOR EVERY INDUSTRIAL NEED







Quaker Oats Co.
Ralston Purina Co.—11 plants
Republic Steel Corp.—2 plants
Rochester & Pittsburgh Coal Co.
Shepard Niles Crane & Hoist Corp.
Square D Co.
Stromberg-Carlson Co.
The Studebaker Corp.—3 plants
Swift & Co.—18 plants
Tennessee Coal, Iron & R. R. Co.
Tennessee Eastman Co.
Union Carbide & Carbon—3 plants
United States Gypsum Co.—4 plants
United States Leather Co.—5 plants
Walworth Co.—2 plants
W. Va. Pulp & Paper Co.—2 plants
Western Electric Co. Inc.
Wilson & Co.—8 plants
Worthington Pump—2 plants
Rudolph Wurlitzer Co.—2 plants
Wyman Gordon Co.
Willys-Overland Motors, Inc.

Automotive Manufacturing—
112 plants

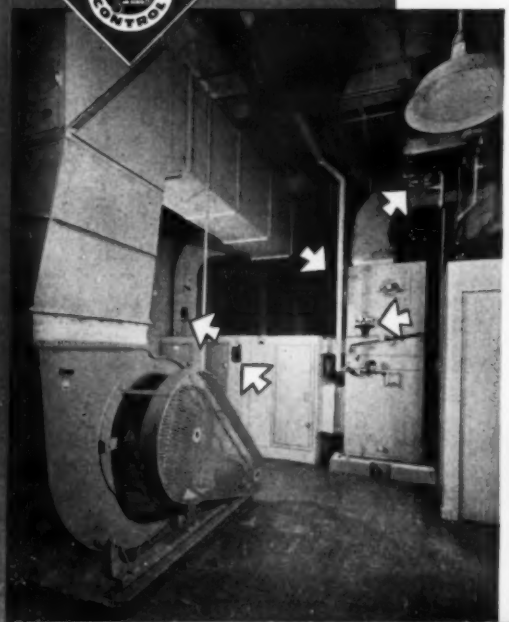
DETROIT STOKER COMPANY

GENERAL MOTORS BLDG., DETROIT 2, MICH.

Works at Monroe, Mich. • District Offices in Principal Cities

POWERS for Heating and

PNEUMATIC CONTROL SYSTEMS



POWERS Design for MODERN CONTROL PANEL

In the unique functional design of this Control Panel are integrated various types of POWERS pneumatic controlling, indicating and recording instruments. It masterminds the operation of four complete year round air conditioning systems in the modern plant shown on the next page.

Photos at left and top and bottom of next page show air conditioning systems regulated by the Control Panel. Arrows indicate Powers controls.

Photo below, left—shows four refrigerator compressors, one for each air conditioning system; photo right—Powers air compressor and pilot valves supplying air pressure for control system.

Air Conditioning

Pull Heating Costs Down As Fuel Prices Rise

Room Thermostat for Offices

POWERS TEMPERATURE and HUMIDITY CONTROL SYSTEMS prevent OVER-heated air in offices, factories, process rooms and other spaces. Comfortable, healthful room temperature—not only increases output of workers, but—

★ **Cuts Heating Costs up to 25%**—Keeping each room at its proper temperature prevents waste of fuel from OVER-heating. With todays much higher fuel costs, bigger savings than ever before are now possible with Powers control.

Constant Temperature and Humidity conditions in each room can be maintained at any predetermined point with Powers control. It can be installed in existing as well as new buildings.

25 to 40 Years of Dependable Service with very low maintenance cost is reported by hundreds of users. Powers control is notable for its continuous accurate performance.

Precision Control for Processes—Wherever product uniformity and quality are dependent upon precise temperature and humidity regulation, use Powers controlling, indicating or recording instruments.

New modern plant commemorating 60th anniversary of The Powers Regulator Co., pioneer in pneumatic operated controls for heating, air conditioning systems and industrial processes.

Phone or write our nearest office for help in selecting the type of automatic control that will give best results for your requirements. There's no obligation.

THE POWERS REGULATOR CO.

Established 1891 • SKOKIE, ILLINOIS • Offices in Over 50 Cities

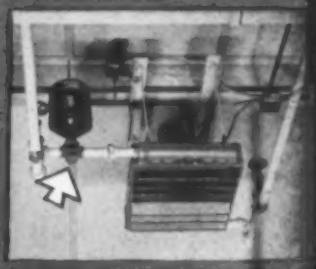
CHICAGO 13, ILL., 3819 N. Ashland Ave. • NEW YORK 17, N. Y., 231 E. 46 St.
LOS ANGELES 5, CAL., 1808 W. 8th St. • BOSTON 15, MASS., 125 St. Botolph St.
DETROIT 1, MICH., 2631 Woodward Ave. • TORONTO, ONT., 195 Spadina Ave.
PHILADELPHIA 32, PA., 2240 N. Broad St. • ATLANTA 3, GA., 142 Spring St. N.W. • GREENSBORO, N. C., 101 N. Elm St.

(a83a)

POWERS

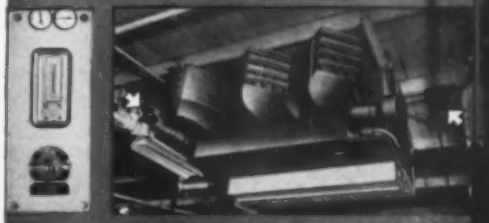
Above: Arrows indicate some of the many controls applied to air conditioning system: Powers Duct Hygrostat, Duct Thermostat Pneumatic Switch, Diaphragm Valves and Damper Motors Static Pressure Regulators, etc.

Photo at right shows ceiling type unit heater used in factory. It is controlled by wall type thermostat which also regulates Vulcan fin type radiation below windows.



Left: instrument panel for Powers MASTROL System of forced hot water temperature control for heating.

Below: Factory fresh air ventilating units heat and filter outdoor air providing two complete changes per hour in winter and two in summer.



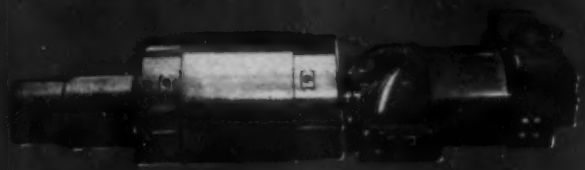
POWERS

ELLIOTT
equipment for power and process

Deaerating Heaters

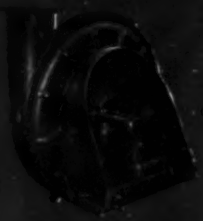
Condensers

Generators for Diesels



Turbine Generators

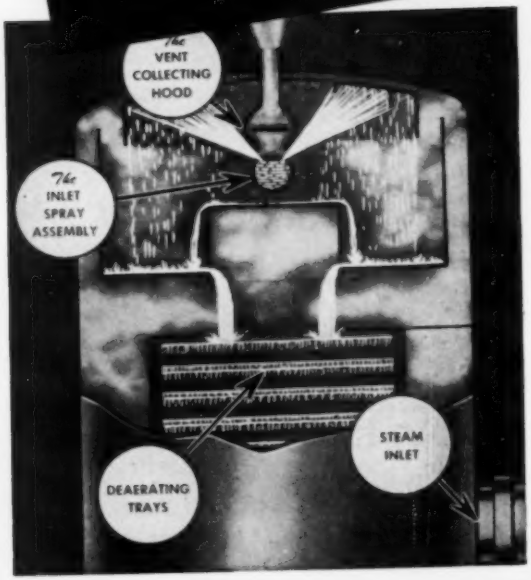
Large Motors

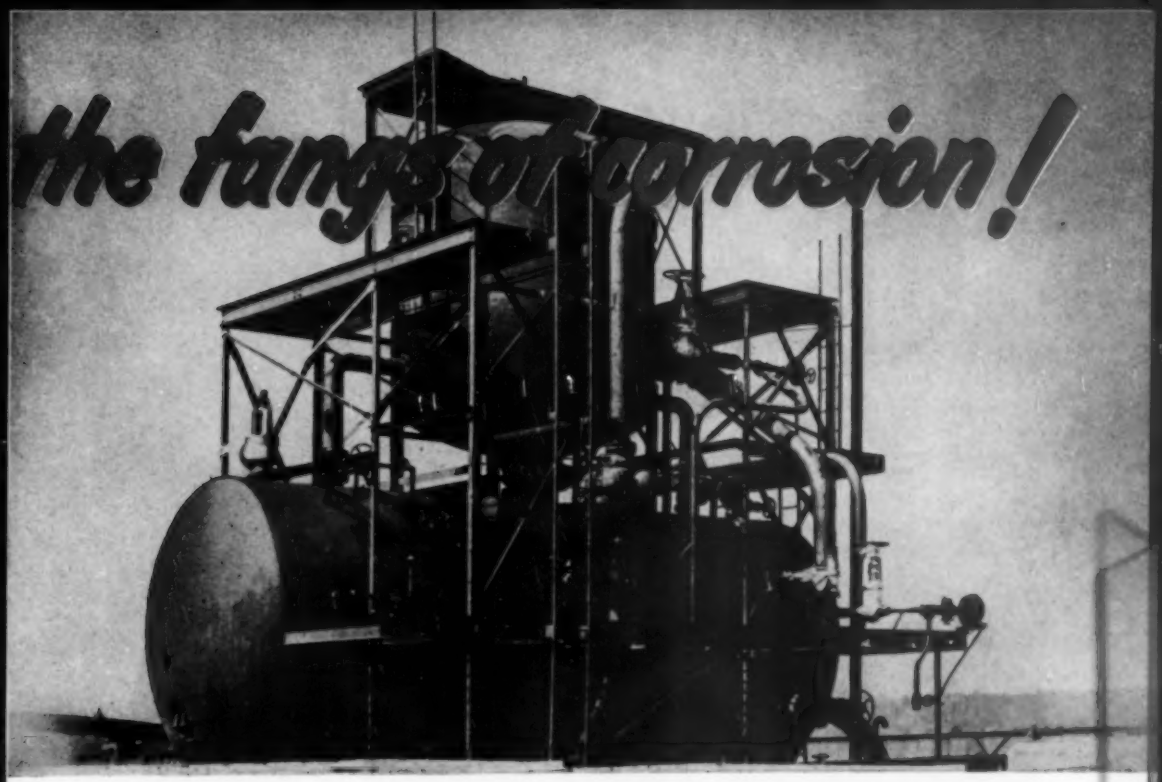


Centrifugal Blowers

They draw

ELLIOTT DEAERATING HEATERS





Skyline views of most modern power plants

may show the Elliott deaerating heater mounted on its storage tank, as in the southern station pictured above. It is a symbol of liberty from the corrosive oxygen which it removes from boiler feedwater — a freedom which dates from the initial development of the deaeration principle by Elliott engineers.

This is the inlet spray unit and vent collecting hood, mounted inside the shell at the top. (See section drawing at left.)

The design of the Elliott deaerating heater of today virtually eliminates maintenance. The tubular vent condenser formerly used is replaced with an inlet spray unit and vent collecting hood that require no attention, and also cut down the unit's vertical dimension, important in limited headroom. Trays are of light stainless steel. Wherever undeaerated water contacts the metal, non-corrodible material is used.

The complete deaerating heater is built throughout in the Elliott shops. Full details are given in Bulletin N-16, mailed on request.

ELLIOTT Company

Deaerator and Heater Dept. • JEANNETTE, PA.

Plants at: JEANNETTE, PA. • RIDGWAY, PA. • AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.

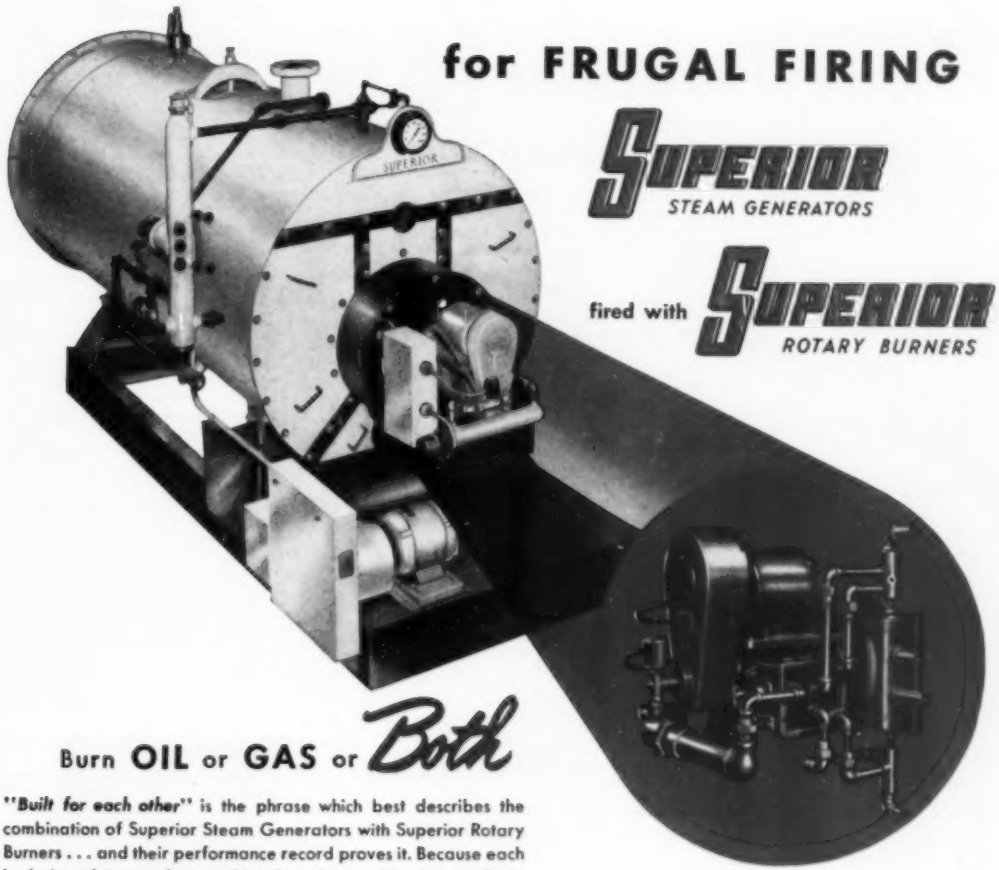
DISTRICT OFFICES IN PRINCIPAL CITIES

Q2-2

for FRUGAL FIRING

SUPERIOR STEAM GENERATORS

fired with **SUPERIOR** ROTARY BURNERS



Burn OIL or GAS or *Both*

"Built for each other" is the phrase which best describes the combination of Superior Steam Generators with Superior Rotary Burners . . . and their performance record proves it. Because each is designed to supplement the other, the combination results in combustion efficiencies that spell maximum fuel economy.

Where combination gas/oil burners are employed, a specific advantage of Superior Burners lies in the ease and simplicity of changing from either fuel to the other. The changeover takes but a minute or so without disconnecting any piping, and without interruption of steam supply.

Superior Rotary Burners are fully automatic, burning the heaviest catalytic fuel oils. Gas burners burn any type of natural, manufactured, or bottled gas. Owners of Superior combination gas/oil burners can profit from the slightest fluctuation in the price of either fuel . . . switching from one to the other as economy dictates.

Superior Steam Generators are manufactured in 18 sizes, ranging from 20 to 600 b.h.p. for pressures to 250 p.s.i., or for hot water.

For complete details write for Catalog 411.

Sound fundamentals contribute to the high operating efficiencies of Superior Rotary Burners.

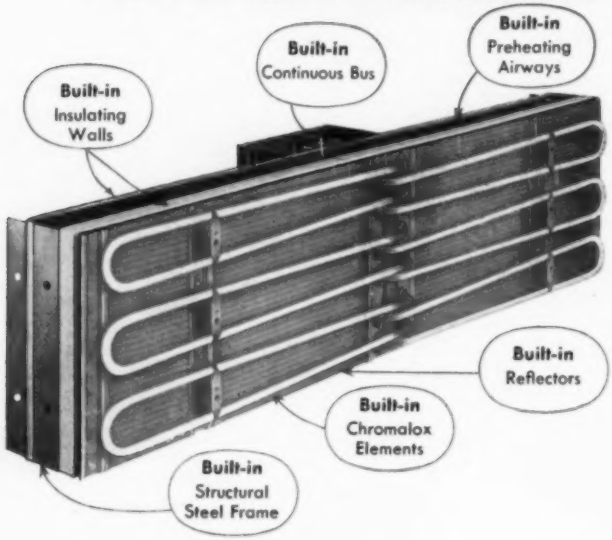
- Time-tested horizontal-rotary design.
- V-Belt Drive for the high cup speed essential to efficient atomization.
- Four-Hole Hinge circulates oil through oil heater so that hot oil is on the pressure side of the pump, allowing you to burn oil at higher temperatures.
- Adjustable Air Nozzle provides accurate control of flame contour.
- Dual Pumps and Reservoir combined with Constant Oil Rate Control provide controlled firing regardless of viscosity variation.
- Fully automatic with dual ignition, and hi-low or fully modulating control.

for performance you can **BANK** *on*

SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 18, N.Y.

SUPERIOR STEAM GENERATORS

Announcing a **new** and **better** *INFRARED* **Generator**



CHROMALOX *Electric* RADIANT PANELS

Now, more efficient *far*-infrared comes in convenient pre-engineered panels, reducing oven building to a matter of determining heat requirements and assembling panels to fit the job.

CHROMALOX Electric Radiant Panels generate more uniformly absorbed *far*-infrared heat with quick heat-up and reduced oven lengths.

It's the *far*-infrared wave length that makes the difference.

- ✓ **9200 Btu's per square foot output per hour.**
- ✓ **Insulated for voltages to 575 V.**
- ✓ **Lowest installed cost per kilowatt and per square foot.**
- ✓ **Work temperatures to 700° F. easily obtained.**
- ✓ **Accurate "dialed" control.**
- ✓ **Absolutely uniform radiation—no hot or cold spots.**
- ✓ **Built to UL and NBFU requirements.**

Now... Oven Building as Simple as A B C

It's easy to build ovens of any desired height and length with lightweight Chromalox Electric Radiant Panels. Panels come in 1 x 4 ft. and 2 x 4 ft. sizes, ready to erect and connect with easy-to-follow instructions in each carton. Chromalox on-the-spot engineering assistance to help determine your requirements is yours—no obligation, of course.

CHROMALOX *Electric Heat*

Does More - Better - Consistently

Radiant Heating Division EDWIN L. WIEGAND CO.,
7563 THOMAS BLVD., PITTSBURGH 8, PA.

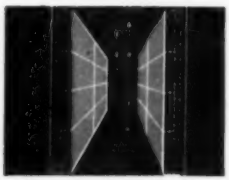
CHROMALOX
FAR-INFRARED

For Baking, Drying, Curing, Dehydrating

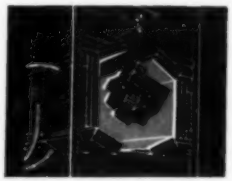
and many other applications.

9 WAYS BETTER

1. **Longer wave length**—absorbed equally fast by all colors.
2. **Shatter-proof construction**—nothing to break and contaminate.
3. **Non-diminishing output** from all-metal Chromalox tubular heat generators.
4. **Uniform heat**—no hot or cold spots.
5. **High intensity radiation**—with more watts per square foot.
6. **Quick heat-up** with energy transformed instantly into heat on the work.
7. **Low-cost oven assembly.**
8. **Infinitely variable output**—from 0 to 100% of capacity.
9. **Additionally safe** for any work involving volatiles.

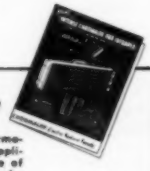


Easily erected banks of Chromalox Radiant Panels are ideal for line production. Far-infrared heat is radiated directly and uniformly without hot spots over entire work area.



Chromalox Radiant Panels can be erected into any oven shape. Rugged construction permits their use in assembly lines, even when hazards of splashed liquids, volatiles and moisture are present.

Get this Bulletin



It contains complete information, specifications and application ideas for the use of Chromalox Radiant Panels. Write for your copy today.

1C-66

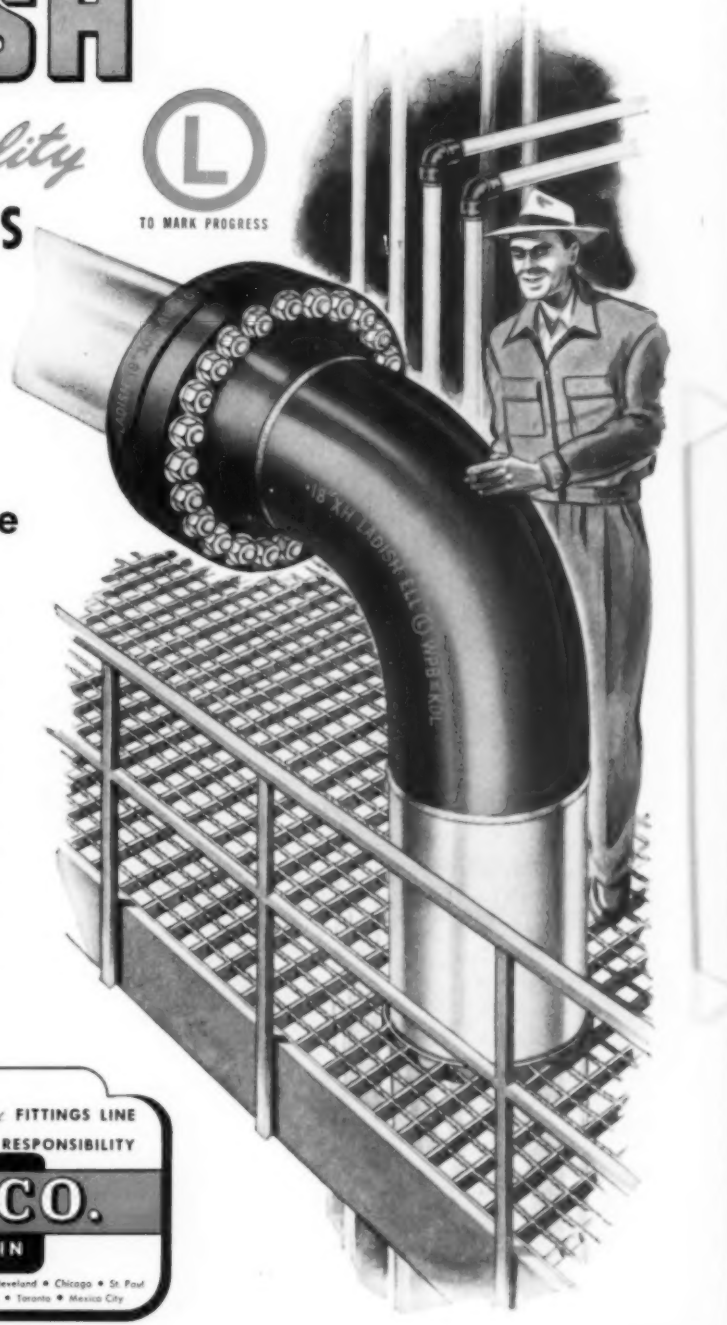
C. B. Rogers and Associates, 1000 Peachtree St., N. E., Atlanta 5, Ga.; L. R. Ward Co., 2711 Commerce St., Dallas 1, Texas; 1814 Texas Avenue, Houston 3, Texas; 1519 South Boston Ave., Tulsa 14, Okla.; Ranson, Wallace & Co., 116½ East Fourth Street, Charlotte 2, N. C.

LADISH

Controlled Quality

PIPE FITTINGS

TO MARK PROGRESS



metallurgically sound for maximum service

Sound metallurgy . . . the result of unsurpassed facilities and advanced laboratory controls . . . provides the maximum of dependability in Ladish Controlled Quality fittings. Every phase of metal quality . . . composition, structure and physical properties . . . is continuously safeguarded—and certified proof of metallurgical integrity is available to users of Ladish fittings.

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF...ONE RESPONSIBILITY

LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
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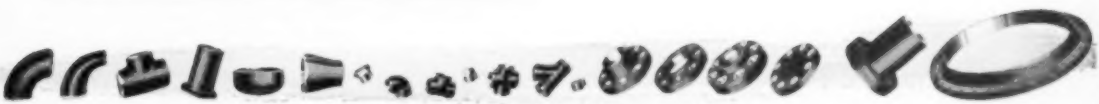


Hays Guide to Boiler Plant Results

increased efficiency

"Operating efficiency has been as high as 82%—much of the credit going to the accuracy of (Hays) automatically controlled combustion."

SHERWIN WILLIAMS, Chicago Plant

low maintenance

"we find that due to the (Hays) properly controlled combustion, our maintenance on both stokers and boilers has been considerably decreased."

AMERICAN TOBACCO COMPANY

fuel savings

"we estimated that . . . we would be able to pay for the new equipment (Hays Combustion Control) out of the fuel savings in three years. Since then, the records show that the amortization of the original investment has been accelerated."

RAYBESTOS-MANHATTAN, INC.

rapid response to wide load swings

"we have made test runs using the Hays system, bringing the load rapidly up from 8,000 to 80,000 lbs per hour with excellent results. Fuel-air ratio was held at the desired value and CO_2 at 15%."

BEMIS BROTHERS BAG CO.

HAYS COMBUSTION CONTROL GETS RESULTS . . . *Proof of this statement is available in the form of case histories on the boiler plant experience of 9 leading companies. These "result stories" cover small, medium, and large boilers—burning all types of fuel, including alternate fuels—with different load characteristics—and different uses for steam.*

Send us a brief statement of your specific conditions and specifications. You'll receive the case histories which fit your needs and a 48 page booklet on "Boiler Plant Instrumentation".

Automatic Combustion Control
Boiler Panels • Hays-Penn Flowmeters
Venturi Meters and Venturi
Gas Analyzers • Draft Gages
Combustion Test Sets • CO_2 Recorders
Electronic Oxygen Recorders

THE hays CORPORATION

MICHIGAN CITY 4, INDIANA

Large Power Producer Meets Demands up to 400,000 lb per hour with Evaporation Rate of 12.8

"During the many years we have been generating power at Scovill Manufacturing Company, Waterbury, Conn.," says Leo Niekerk, Power Plant Chief Engineer, "we have evolved a general philosophy for power plant operation: buy the best equipment available, then operate and maintain it in the most intelligent way possible. We have two power houses—the West Power House containing one 500 kw vertical turbine, one 3,000 kw condensing turbine generator, and two 600 hp oil-fired 150 psi boilers on standby; and the East Power House containing three 3500 kw condensing turbines, one 5,000 kw topping turbine, six 600 hp stoker-fired 250 psi boilers and, handling most of the load, two 660 psi oil or pulverized coal-fired steam generating units rated at 225,000 lb/hr and 150,000 lb/hr."

fuel handling

"Coal from railroad cars is transferred to overhead bunkers by a conveyor system. Fly ash from dust collectors is removed by conveyor ash handling system and discharged through an outside silo. Oil is stored in two 150,000 gal. tanks and fed by gravity to the fuel oil pumps in the basement."

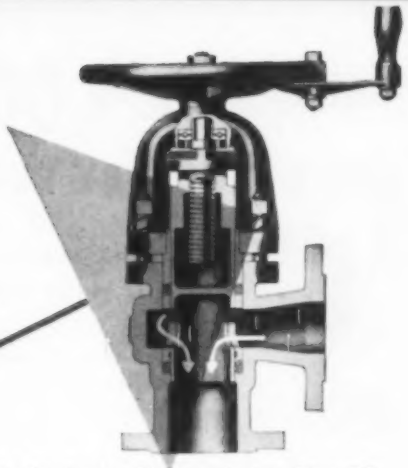
combustion control

"When we installed our Boiler #1 in 1940 we selected Hays Combustion Control. We were so pleased with its operation during the next six years that when we installed Boiler #2 in 1946 we again specified Hays Combustion Control. Each boiler has its own Hays panel containing a complete complement of modern boiler room instruments and controls. Currently we are meeting steam demands up to 400,000 lb per hour (with load swings as high as 60,000 to 70,000 lb per hour) while achieving an evaporation rate of 12.8, a fuel cost per kw of $.0049, and a cost per thousand pounds of steam of $.706. No small part of the credit for the versatility and efficiency of our operations should go to the Hays Combustion Control System. Maintenance expense on the control system has been negligible.

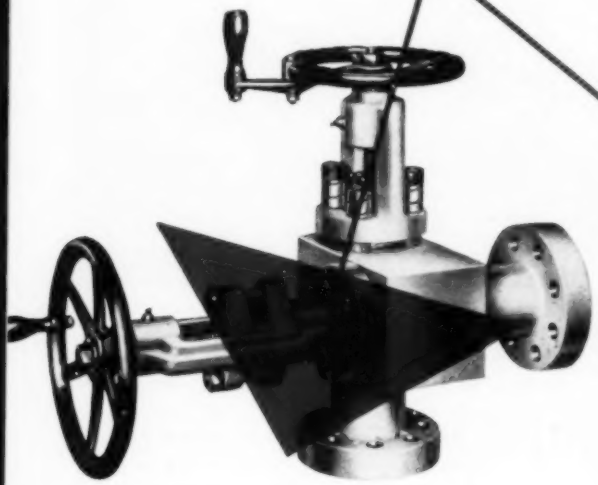
The above story is a condensation of a completely illustrated case history on the power plant operation of Scovill Manufacturing Company. Write for Bulletin R-8, available free from The Hays Corporation, Michigan City, Ind.

OVER 15,000 BOILER PLANTS USE THESE BLOW-OFF VALVES

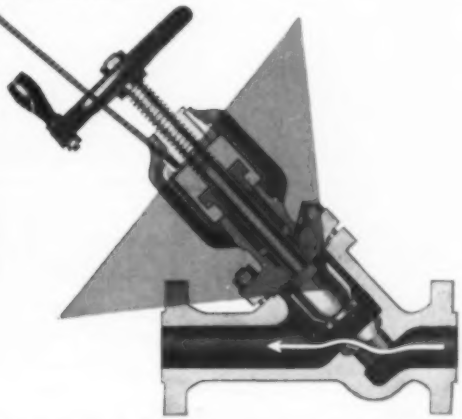
MADE FOR EVERY PRESSURE



This is the famous Yarway *Seatless* Blow-Off Valve. Balanced, sliding, nitralloy plunger design eliminates seat—a common source of wear, clogging and leaking. Type B (above) for pressures 50 to 400 psi, angle or straightway, single or tandem. Other types available for higher pressures. Complete description and specifications in Bulletin B-424 for pressures to 400 psi, or Bulletin B-433 for higher pressures.



The Unit Tandem—Yarway's finest blow-off valve for high pressure service. Combines a Hard Seat Valve (for blowing) and a Seatless Valve (for sealing) in a one-piece forged-steel body, flanged or socket welding ends. Also available combining two hard-seat valves. For pressures to 2500 psi. See Bulletin B-433.



This is Yarway's Stellite-Seat Valve for pressures to 2500 psi. Shown here in open position. Disc and seat ring are stellite-faced and carefully mated for tight seating, long life and hard wear. Angle or straightway, single or tandem combinations (hard seat—hard seat or hard seat—seatless) available. Complete specifications and description in Yarway Bulletin B-433.

YARNALL-WARING COMPANY • ***Home Office:*** **116 Mermaid Avenue, Philadelphia 18, Pa.**

Southern Representative: **ROGER A. MARTIN, Bona Allen Building, Atlanta 3, Ga.**

YARWAY **STEAM PLANT EQUIPMENT**

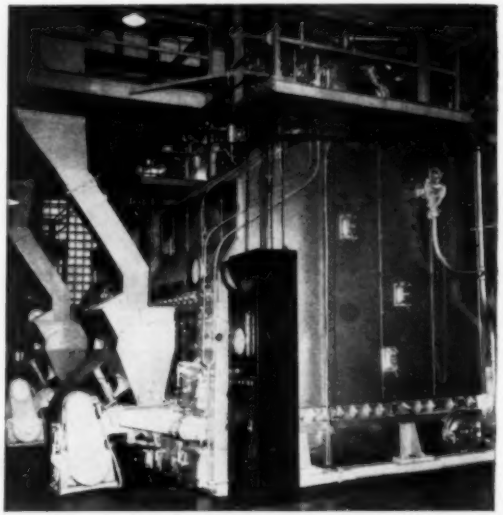
"WE SAVE $9,000 A YEAR—AND HEAT MORE SPACE—BY BURNING COAL THE MODERN WAY!

NEW COAL INSTALLATION SAVES US 31.9%—43¢—ON EVERY THOUSAND POUNDS OF STEAM!"

says Mr. Robert W. Paul, Heating Engineer, the University of Akron, Akron, Ohio.

NO SMOKE CONDITION... NO DUST NUISANCE—

this plant is located in a residential neighborhood and operates well within the bounds of extremely tight smoke and dust regulations—thanks to burning and handling coal with up-to-date equipment!



This view shows Akron's two new stoker-fired boilers. The old equipment delivered a thousand pounds of steam at a cost of $1.35. Now Akron gets a thousand pounds of steam for only 92 cents, *cutting cost by nearly* ⅓! For about $26,000 a year, this new plant does the work that would have cost $35,000 with the old one.

If you operate a steam plant, you can't afford to ignore these facts!

COAL in most places is today's lowest-cost fuel.

COAL resources in America are adequate for all needs—for hundreds of years to come.

COAL production in the U.S.A. is highly mechanized and by far the most efficient in the world.

COAL prices will therefore remain the most stable of all fuels.

COAL is the safest fuel to store and use.

COAL is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

BITUMINOUS COAL INSTITUTE

A Department of National Coal Association, Washington, D. C.

Planning to modernize? Building a new plant? In either case an up-to-date coal installation can save you lots of money!

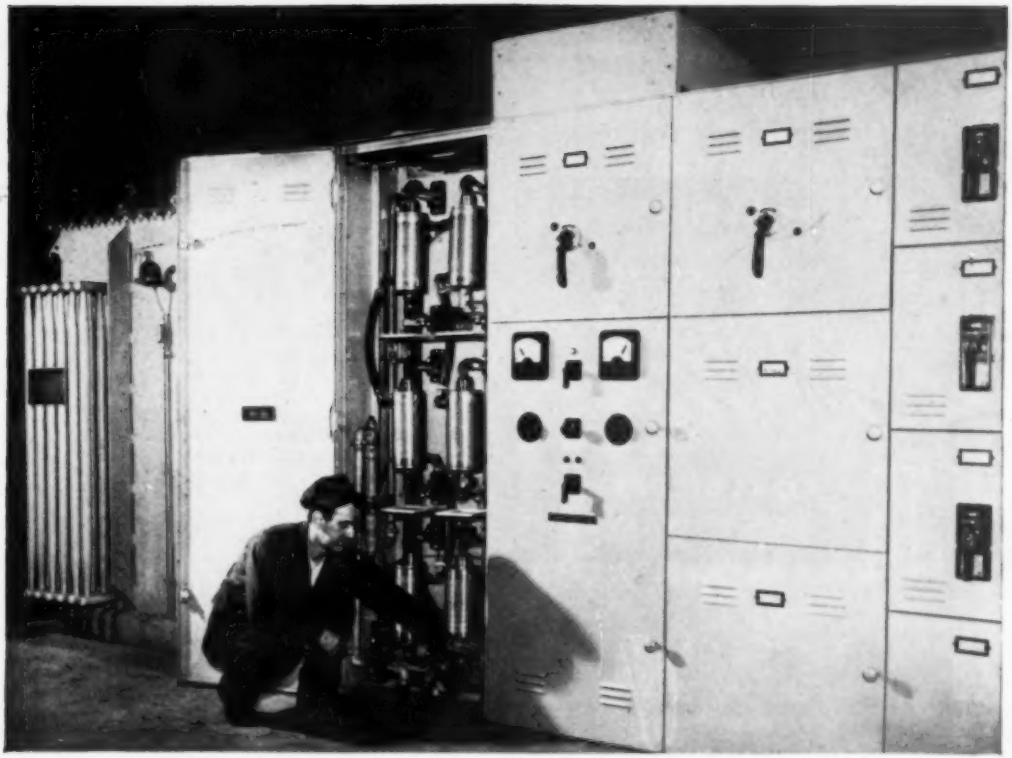
Labor costs are cut to a minimum with modern coal- and ash-handling systems . . . modern combustion equipment gives more steam per dollar—10 to 40% more power from every ton of coal!

A consulting engineer can show you how these savings really mount up—and mount up fast—when you burn *bituminous* coal in a modern plant designed to meet your *specific* needs.

And coal's your best bet for the future, too. Of all fuels, coal alone has virtually unlimited reserves. And America's coal is mined by the most productive and efficient coal industry in the world. That's why coal offers greater price stability and more dependable supply than any other fuel!

FOR HIGH EFFICIENCY FOR LOW COST

YOU CAN COUNT ON COAL!



THIS G-E RECTIFIER AT ALLIANCE HAS REQUIRED NO MAINTENANCE SINCE INSTALLATION IN 1950.

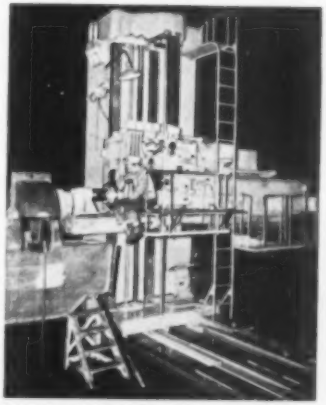
Producer of world's largest cranes uses 300-kw rectifiers for DC power

Alliance Machine Co. gains higher line efficiencies by using General Electric Ignitron Power Rectifiers

In the manufacture of mammoth cranes and other heavy factory equipment, the Alliance Machine Company, Alliance, Ohio, depends on the d-c power from its G-E Ignitron Rectifiers to run hundreds of machine tools throughout the plant.

Installed late in 1950, the mercury arc rectifiers have been in service ever since, requiring no maintenance, with not even a tube needing replacement.

The G-E Ignitron Rectifiers, such as those at Alliance, operate 24 hours a day, 7 days a week. Supplied as a complete packaged unit with transformer and metal-enclosed switchgear, the installation occupies minimum space. For information on a G-E Ignitron Rectifier to fit your d-c power needs, call or write your nearest G-E sales office. General Electric Company, Schenectady 5, N. Y. 324-7



This giant boring mill operates on d-c power supplied by the 300-kw G-E Ignitron Rectifiers at Alliance.

GENERAL ELECTRIC

Safeguard

WORKERS PLANT PRODUCTION

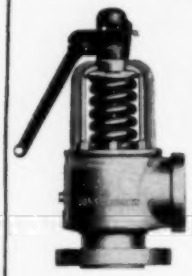
Specify

CONSOLIDATED SAFETY VALVES

The dependability and high performance standards of Consolidated Safety Valves assure maximum protection of employees, plant facilities and production. Proved in thousands of installations during the past 75 years, these spring-loaded valves provide high discharge capacity, positive and tight closing after operation.

The capacities of all Consolidated Safety Valves are guaranteed and proved by flow measurements. A 2100-pound design boiler, used exclusively for testing and setting, is further assurance that Consolidated Safety Valves are the best protection available.

Whatever your working pressures and temperatures, the complete line of Consolidated Safety Valves makes selection easy for your particular needs. They have few working parts, are tough, and require little maintenance throughout their long service life. Full information, including safety and service feature data, are yours on request. Write for Catalog 700.



TYPE 1411 IRON BODY SAFETY VALVE

Sizes: 1½" through 6".
Pressures: Up to 250 P.S.I.
Temperatures: Up to 450° F.
Standard Connections: Threaded or flanged.

Designed with a bevel seat, single ring blowdown control and a one-piece feather (disc), this high capacity, wing guided valve incorporates every feature essential to complete dependability, positive protection and ease of maintenance. Recommended installations include water tube boilers, mechanically fired fire tube boilers, accumulators, unfired pressure vessels and pipe lines within its rated capacity. All sizes available with oversize inlet flanges for replacement purposes.

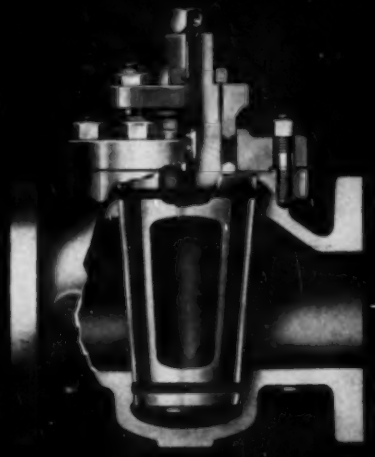
TYPE 1415 STEEL BODY SAFETY VALVE

Sizes: ½" through 6".
Pressures: Up to 600 P.S.I.
Temperatures: Up to 900° F.
Standard Connections: Flanged.

Body is cast steel. Has a high erosion and corrosion stainless steel seat bushing **seal welded to the base.** Recommended for all applications beyond the scope of its companion valve in cast iron, Type 1411 shown above. It is a high capacity wing guided valve with fully exposed spring—a rugged, dependable and economical valve proved in thousands of field installations. Available with oversize inlet flanges.

CONSOLIDATED SAFETY VALVES

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONN.
MAKERS OF 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'HANCOCK' VALVES, 'ASHCROFT' GAUGES. BUILDERS OF "SHAW-BOX" CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.



LUBRICATED PLUG

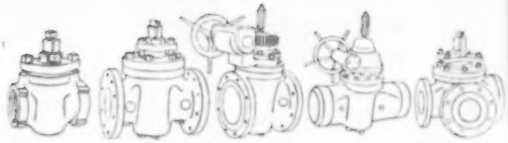
COMPLETE LINES OF LUBRICATED PLUG VALVES

Because of the wide range of services to which Lubricated Plug Valves can be adapted, they may be classed as "all-purpose" valves. Walworth manufactures complete lines of Lubricated Plug Valves in a variety of types and materials for working pressures up to 5,000 psi and for vacuum services. Sizes range from ½ to 30 inches. Write for descriptive literature.

Walworth also manufactures complete lines of gate, globe, angle, and check valves made of steel, bronze, iron, and special alloys.

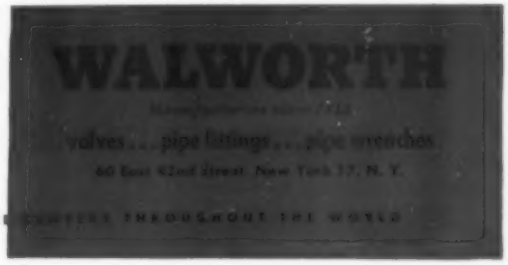
Walworth valves, pipe fittings, and pipe wrenches total approximately 50,000 items and are sold through distributors all over the world.

Walworth engineers will be glad to help you with your problems. Call your local Walworth distributor, nearest Walworth sales office, or write to our General Offices, 60 East 42nd Street, New York 17, New York.



Illustrated in section is a Walworth No. 1700F Regular Gland Type, Wrench Operated, Steeliron, Lubricated Plug Valve. This particular line of valves has a working pressure rating of 200 psi at 150F or 125 psi at 450F. Sizes range from ½ to 8 inches. Other Walworth Lubricated Plug Valves include Single Gland and Ball Bearing types. They are available for a variety of working pressures.

For best results use Walworth Lubricants and Walworth High Pressure Lubricant Guns.



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UNIBESTOS®

YOUR UNARCO WAREHOUSING DISTRIBUTOR HAS UNIBESTOS INSULATIONS IN STOCK

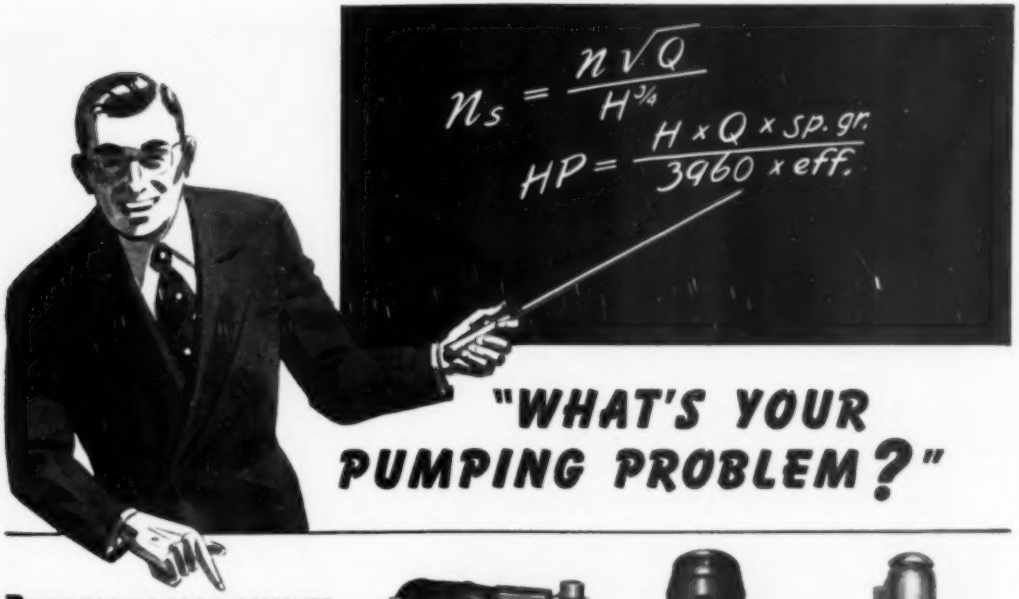
From coast to coast, from north to south, Unibestos is winning new friends. First, because this quality insulation is economical, efficient, long-lasting. Second, because—wherever you are—there's a reliable distributing organization ready to supply you from stock. For temperatures up to 1200° F., specify Unibestos No. 1200. Ask for Unibestos No. 750 when the temperature won't go over 750° F. And, for needs up to 600° F., you can get Unarco Amocel from these same Warehousing Distributors. Unibestos is made in cylinders, half-rounds, and blocks. If you don't know your nearest Unarco Distributor, we'll be glad to send you his name. Please ask us, too, for Bulletin 76-109.

For further information write or call
333 Candler Building, Atlanta, Georgia. Telephone Lamar 7113

UNARCO

UNION ASBESTOS & RUBBER COMPANY

DEPT. F10, 332 SOUTH MICHIGAN AVENUE • CHICAGO 4, ILLINOIS



"WHAT'S YOUR PUMPING PROBLEM?"

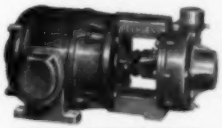
PEERLESS HAS THE *ANSWER*

Many of the problems of transferring liquids which are troublesome to you today have probably already been successfully studied and solved for others by our engineering department.

Problems arising from countless combinations of conditions of capacity, head, temperature, pressure, specific gravity, viscosity, volatility, chemical analysis, solids concentration, NPSH and other variables have been resolved by our hydraulic engineers. From thousands of case histories we can counsel with you on everything from pump cavitation caused by incorrect sump construction, to the design limits of impeller diameters as effected by peripheral speeds.

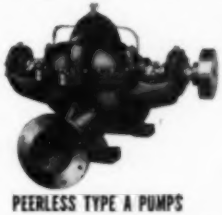
Why not take advantage of a backlog of 30 years of practical pumping experience to solve your liquid transfer problems?

Hand us your pumping problem. We believe we can give you a successful Peerless answer to it from the scores of types and hundreds of models of horizontal and vertical Peerless pumps.



PEERLESS FLUIDYNE PUMPS

A line of face mount and flexible-coupled, electrically driven pumps for almost universal water pumping application. Capacity range: to 5500 gpm. Completely described in Bulletin No. B-2300.



PEERLESS TYPE A PUMPS

The standard of the industry for high quality, split-case horizontal pumps. Capacity range: up to 70,000 gpm. Completely described in Bulletin No. B-1300.

PEERLESS CLOSE-COUPLED VERTICAL TURBINE PUMPS

Widely and successfully used in cooling tower service and pumping from surface water sources. Up to 2500 hp. Completely described in Bulletin No. B-159.

PEERLESS HYDRO-FOIL PUMPS

The giants in the world of moving water. Both propeller and mixed-flow types available. Completely described in Bulletin No. B-148.

Remember—**PEERLESS BUILDS *DEPENDABLE* PUMPS**

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Factories: Los Angeles, Calif. and Indianapolis, Indiana
Offices: New York, Atlanta, Chicago, St. Louis, Phoenix, Fresno, Los Angeles; Dallas, Plainview and Lubbock, Texas; Tulsa, Albuquerque, New Mexico.
Distributors in Principal Cities; Consult your Telephone Directory.

PEERLESS PUMPS
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301 West Avenue 26, Los Angeles 31, California

Please send us a bulletin on:

☐ FLUIDYNE PUMPS ☐ HYDRO-FOIL PUMPS
☐ TYPE A PUMPS ☐ CLOSE COUPLED PUMPS

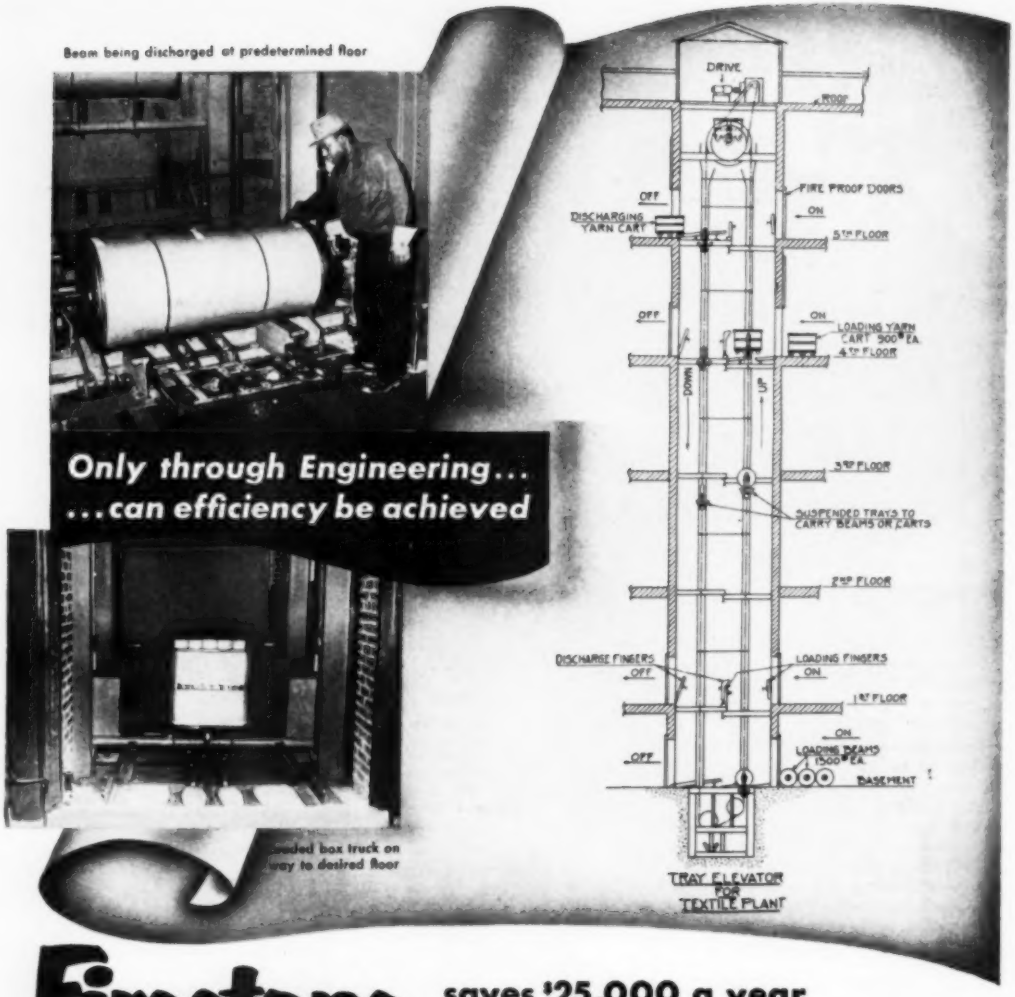
NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

S.P.I.



Firestone saves $25,000 a year with this G-W "Ferris Wheel"

Moving 1300-lb. beams of rayon and 900-lb. box trucks in and out of freight elevators is a back-breaking job. Yet approximately 230 of these bulky loads must be lifted (and empties returned) every day at the Firestone Textiles Division of the Firestone Tire and Rubber Co., Gastonia, N. C.

This Gifford-Wood "Ferris Wheel"—a 6-story roundabout tray elevator—has assumed most of the work load. Beams and trucks are automatically picked up on the loading side of a shaftway by trays suspended between two endless chains, carried to the top, eased over the drive sprockets, lowered to the desired floor, and automatically discharged.

The $25,000 annual saving is basically one of reduced labor requirements and improved handling efficiency, and the limited manual work remaining is much less strenuous than formerly.

This is just one of many conveyors born of G-W ingenuity and experience—a product of efficiency through engineering. Call on G-W Materials-Handling Engineers to survey your present methods; you are under no obligation. It might well prove to be a step toward higher profits through lower operating and maintenance costs.

When You Think of Materials Handling—Think of **GIFFORD-WOOD CO.**

Since 1814 • Hudson, New York

NEW YORK 17, N. Y. 420 LEXINGTON AVE. | ST. LOUIS 1, MO. RAILWAY EXCHANGE BLDG. | CHICAGO 6, ILL. 565 W. WASHINGTON ST.

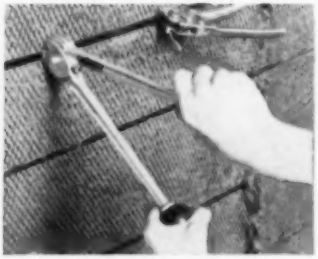
GW 8405

EAGLE PICHER Insulations

Carefully designed to fit your needs, to save you time, power, money

SUPERTEMP BLOCKS

These are efficient insulating blocks manufactured from Eagle-Picher High Temperature Mineral Wool. They derive low thermal conductivity, high refractory value, and outstanding chemical and physical stability from this basic insulating material. Weight is approx. 22 to 24 lbs. per cu. ft. Designed for temperatures up to 1700 F.

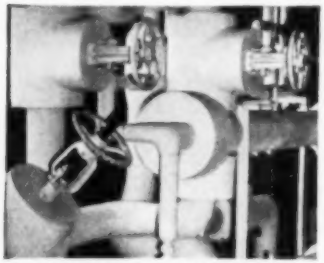


MINERAL WOOL BLANKETS

The answer to the problem of quickly and efficiently insulating flat or curved surfaces on larger types of heated equipment. Factory-made, these blankets are certified to meet rigid high standard specifications, offer unexcelled uniformity of mineral wool distribution. Withstand continuous exposure to temperatures as high as 1200 F. . . . offer maximum water repellence . . . resistance to steam, corrosive fumes, normal vibration.

SUPER "66" INSULATING CEMENT

A rust-inhibitive, super-adhesive insulating cement . . . offers exceptional coverage, extreme thermal efficiency. "Springy ball" structure—with small resilient pellets, each containing thousands of "dead" air cells—provides one of the most effective heat barriers known. Easily trowelled over all kinds of surfaces. Efficient up to 1800 F. . . . reclaimable where temperatures don't exceed 1200 F. Can be applied to any heated equipment.



ONE-COTE CEMENT

One-Cote provides both insulation and a smooth off-white finish coat. Unexcelled for coverage—100 lbs. covers approx. 40 sq. ft. one inch thick—Eagle-Picher One-Cote Cement is of uniformly high quality . . . quick setting, easy to handle . . . can be painted. This self-protected insulation withstands temperatures up to 1000 F.

MAXIMUM FUEL SAVINGS AND EXACT TEMPERATURE CONTROL WITH THESE EAGLE-PICHER INSULATIONS:

• Insulating Felts • Supertemp Block • Blankets • Loose Wool • Pipe Covering • Stalastic • Stamastic • Insulseal • Finishing Cements • Insulating Cements • Fireproofing Cement • Swetchek • Diatomaceous Earth Block.

EAGLE EP PICHER

THE EAGLE-PICHER COMPANY *Since 1843*

GENERAL OFFICES: CINCINNATI (1), OHIO

Insulation products of efficient mineral wool—for a full range of high and low temperatures. Technical data on request.

How to Work at FULL TILT and lose less than ever!

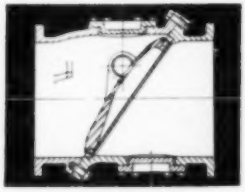
INSTALL

CHAPMAN

Tilting-Disc Check Valves

Take another look at the diagram below. That tilting disc actually *balances as it closes* . . . so that it cushions itself into a drop-tight seat . . . without any slamming under usual piping arrangements.

This means far lower head loss than with other types of check valves. It means, too, far lower rate of wear of moving parts . . . for the disc is the *only* moving part. In fact, it means more savings and less trouble than you ever knew you could get with *any* check valve. Write for Catalog No. 30, giving complete test results at some of the country's leading engineering laboratories.



Cross-section of the Chapman Tilting-Disc Check Valve. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

THE CHAPMAN VALVE MFG. CO.
INDIAN ORCHARD, MASSACHUSETTS

Timely Comments

Read and Learn

5TH ANNUAL BETTER PRODUCTION ISSUE — The entire theme is important. No one will deny the need for "Better Production," but perhaps too few realize the importance of the word "Annual" used in this connection. Each year can actually be BETTER (production-wise) than the year before.

There are two good reasons why it is desirable to re-examine equipment and procedures at least once a year:

1—New possibilities for improvement are being discovered or re-discovered nearly all the time. You do not simply design a good plant, set a good procedure, and continue the same technique indefinitely. Not only are there continuous improvements in materials and machines, but emphasis changes from year to year. A change in raw materials cost or quality may indicate a variety of changes in the processing plant. Or increasing cost of manpower may necessitate better materials handling, more automatic controls. Likewise a change in the finished product may make old methods obsolete overnight.

2—"A new broom sweeps clean". Human behavior is not infallible. So those advances made a year ago begin to slip backward. Many of the advantages begin to evaporate as the shiny new equipment is allowed to lose its fine adjustment and operators get tired of keying up to top performance. Re-examination of old procedures and adding a bit of change in way of improvements does much to keep the production organization on its toes.

Before some bright young mathematician writes in and asks: "What are you going to do to improve after you reach 100 per cent?", we had better settle that point.

In the first place we haven't heard of anyone reaching 100 per cent perfection yet. But if anyone did, he would not stay perfect long. Because, in the game of production, the rules are always being changed. By the time you approach perfection in one instance, you are faced with a new set of needs. That is what makes industrial work so fascinating. There is always room for improvement—always room at the top.

"Well if all of that is true, why read about it? We are just as smart as anybody else; why not go ahead and devise our own improvements?"

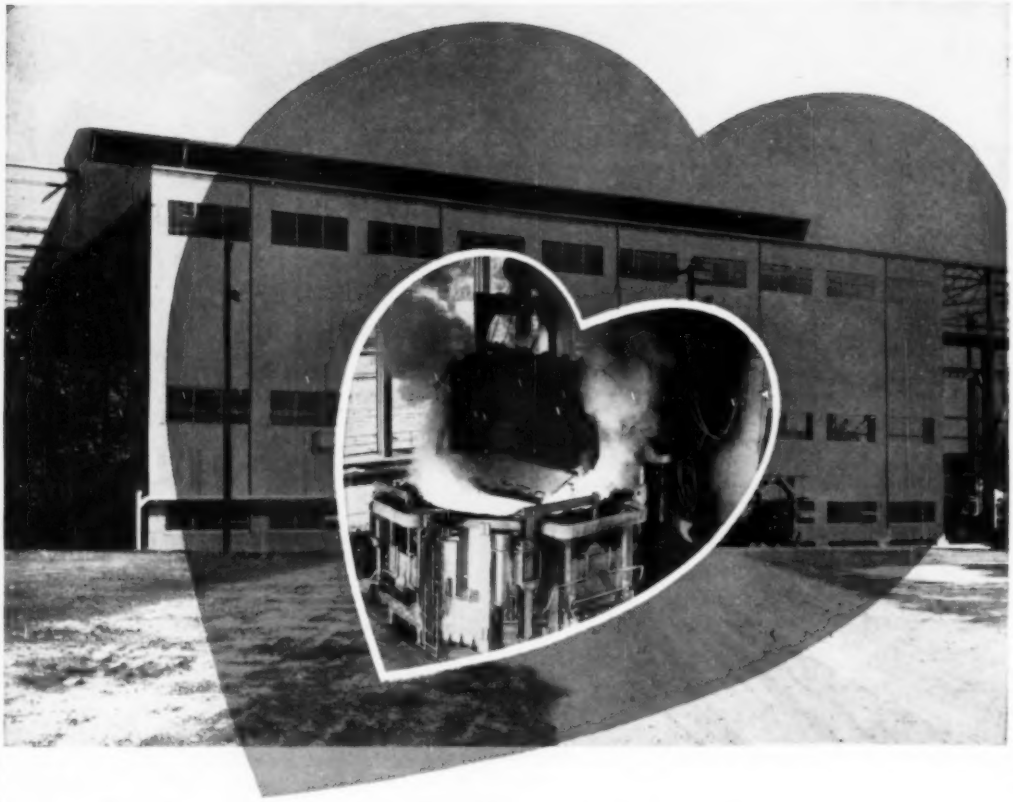
Certainly each man should make his own improvements, conduct tests, experiment, and perfect. But no individual can personally accomplish a very great portion of the whole job, for the simple reason that life is too short. We have to know about and use the experience of others in order to accomplish very much ourselves. A great engineer may put the results of his life's work in one book that may be read and digested in a few hours—a foreman may need only a few minutes to explain something that his assistant would require weeks to learn the hard way.

Those that study this issue will find answers, or partial answers, to many of their problems. The editors have not endeavored to present highly technical, research-type information. Rather, they have brought together a vast store of working knowledge that would be hard to get elsewhere—everday answers to common questions that demand plain answers throughout plants in the South and Southwest.

"Short on theory and long on practice" perhaps, but the basic facts are here. Material gathered from a great many sources is presented in CASE form. That is, each article describes an actual problem in an actual plant, and presents a proven answer.

Skip those items you already know about, and read carefully those that tell you something new. And,

You can help the editors by letting them know what you think of this 5th Annual Better Production Issue.



The Heart of ATLANTIC STEEL'S Plant No. 2

DIXIE'S largest electric furnace is the heart of Atlantic Steel Company's Plant Number 2, where increasing quantities of steel are being produced to meet national defense and civilian needs.

This new 60-ton capacity electric furnace is capable of turning out 112,000 net tons a year—half as much as all three of our open hearth furnaces produced in 1951, when new production records were established.

Now an annual output of more than 300,000 tons of DIXISTEEL will find its way into the hands of our customers throughout the South and wherever steel is needed for national defense.

ATLANTIC STEEL COMPANY • ATLANTA, GEORGIA

MAKERS OF DIXISTEEL SINCE 1901

About the new plant

THE BUILDING

The melt shop building is 200 feet long, 130 feet wide, 90 feet high. Craneways extend an additional 260 feet on the east side and 60 feet on the west side. Space has been provided for two additional furnaces.

ELECTRIC POWER

The furnace alone will use more than 6,500,000 kilowatt hours per month—more than a city of 40,000 people.

ACCESSORY EQUIPMENT

Three overhead cranes are used: the ladle crane has a 110-ton capacity; the charging crane 60-ton capacity; the ingot-handling crane 10-ton capacity. There are two 900 cubic foot scrap buckets and one of 1400 cubic feet.

THE FURNACE

The electric furnace is a top-charge basic lined model J. T. Lectromelt. It has a rated capacity of 60-tons, although it is capable of producing 75 tons of steel ingots per heat. The annual capacity is approximately 112,000 net tons.

Speaking With Industry

SOUTHERN POWER AND INDUSTRY

Line-up with West Texas for Independence

Better Citizens
Better Voters

THIS annual BETTER PRODUCTION issue, devoted to better plant performance, would be incomplete if we failed to point out the part industrial people should play in developing BETTER CITIZENSHIP.

The cry of industrial leaders for survival of individuality has a hollow sound if at the same time these leaders court collectivism by advocating local development at national government expense.

Too frequently the same important leaders that condemn big Federal spending and high taxes rush right to the front and fight for more government money to promote their own pet local projects — projects that are solely of local benefit and should be paid for with local money.

There is a great tendency to class anything that benefits more than a few people as a Federal Project: waterworks, flood control, schools, hospitals, hydroelectric developments, and even some individual plants. Formerly these things were considered locally by local businessmen, and if the need was great enough they built and paid for the necessary facilities.

Fortunately, some communities still do just that. We could name a good many that bring joy to an anti-socialistic heart.

Foremost among the shining stars, and one that has received great publicity (particularly from the Chamber of Commerce), is the $12,000,000 water supply developed by businessmen (citizens) of West Texas.

The disturbing thought that comes from this publicity is the fact that normal, correct behavior of the citizens of West Texas should become BIG NEWS — something to write about and point to as an outstanding example of individual initiative and local fortitude.

We quote from "The story of the three cities—Odessa, Big Spring and Snyder"—as told in *Washington Report*, weekly newspaper published by the Chamber of Commerce of the United States. It is a story of individual initiative and responsibility, as opposed to Government direction, Government financing, and Government control.

"Out in West Texas, where water is scarcer than oil, the citizens of three cities are putting the finishing touches on a $12,000,000 dam on the Colorado River which will supply all their rapidly growing water needs for at least 30 years.

"The project, soon due for completion, is being undertaken without Federal aid and without imposing any taxes. It is being financed by revenue bonds to be paid off with receipts from the sale of water.

"If these Texans had depended on Uncle Sam for help, their project would not have been completed for several more years and would have cost the taxpayers of the whole nation far more than the three cities found necessary to spend.

"An urgent need for a long-range water supply system prompted the residents of Odessa, Big Spring and Snyder to get their project under way. At the outset, the U. S. Bureau of Reclamation was injected into the picture, but its participation was short-lived. After seven months of waiting for and studying the bureau's proposals, the project's sponsors decided that they would be far better off without Federal aid.

"The reclamation bureau's estimates were found to be far too high; it could not promise water for at least five years beyond the desired completion date of the project, and its ideas as to the location of the dam differed from those of the local inhabitants.

"So the three cities went ahead on their own initiative. Their dam, when finished will be 14,500 feet long and 108 feet high, and will impound 66 billion gallons of water, creating a lake 10 miles long and 1¼ miles wide. As an added precaution, in order to meet rapid increases in population, the cities have also developed a new field of subsurface wells, and have already begun distributing water from this source among themselves through a system of pipe lines and pumping stations.

"Result: A completely integrated water supply system—at no cost to the taxpayers of other cities—built on a foundation of individual responsibility."

Regretting as we do that such a sound, logical method of providing for local needs is rare enough to be newsworthy, we are still proud to point it out and say: *This is how it should be done.*

Are we expecting too much of our responsible business men when we ask that they make this kind of action commonplace? Should these West Texans be so highly commended merely because they refused to ask other sections of the nation to pay their local obligations? For the present we must answer, Yes!, to those questions. For the present we must say, Yes! Those West Texans deserve praise for being different. But we look forward to the time when no community will create "hot news" by merely doing what they ought to do.

We believe collectivism in this country is becoming sufficiently alarming, and national taxes are becoming high enough to call a halt. We believe the time will come when we will quit paying twice as much through Federal taxes as it would cost to build our own local facilities with our own hard-earned, forty-cent dollars.

Section 1

Engineering and Records

Keynote of SP&I's 5th Annual Better Production Issue is the increased production efficiency reported by this Texas piston ring manufacturer.

Case 1—Texas Metalworking

Production Improvement Program Pays Off For Fort Worth Piston Ring Manufacturer

Double Seal Ring Company established a machine design department and checked every possible machine or process to improve products and production. Within 28 months, production increase per man-hour averaged 8 per cent.

BACK in 1949, Double Seal Ring Company of Fort Worth, Texas, the nation's largest manufacturer of replacement piston rings for industrial and marine use, took a long look at its plant and products and decided an intensive improvement program would enable the company to better its products, and at the same time lower the cost of producing them.

It set the imagination of all of its executive engineering brains into operation. The purpose: To determine every possible machine or process which might improve products or production—whether or not such machines or processes were commercially available or had ever been heard of.

Program Data

In September, 1949, *William T. Green*, Double Seal's vice-president and general manager, addressed a memorandum to other executives of the company and all engineering officials announcing the launching of the Products and Production Improvement program and outlining plans for carrying it on:

He listed two major phases for the program: 1. Acquisition of new plant machinery, and 2. Execution of various plant projects correlative to phase one. Phase one was viewed as more immediately important—and the tougher of the two.

Green included in his original PPI announcement an extensive list of equipment to be acquired. Of these, 30 per cent were standard machines, readily available from manufacturers and considered suitable for Double Seal's purposes. The balance of the machines, intended for "special" purposes, not only were not available from equipment manufacturers but hadn't even been designed.

At the close of 1951, and 28 months after the program was launched, Double Seal had added 80 per cent of the standard machines and fashioned 70 per cent of the unique machines, equipment specially suited for the company's purposes. While there is much pride at Double Seal concerning the resultant increased production efficiency, greatest pride is exhibited concerning the company's own creations.

Of the need for the seven unique machines built by Double Seal since the inception of PPI—and the machines which best evidence what can be achieved with such a visionary program—the company's chief engineer, *R. W. Hoyt*, said: "The smallness of our average ring order means we have had a substantial problem in how to keep our production facilities flexible enough to handle these small quantities of special size and special type piston rings quickly. It was not possible to purchase

This brief summary of Double Seal Ring Company's Products and Production Improvement Program is based on data furnished by *R. W. Hoyt*, Vice President and Chief Engineer, *Double Seal Ring Company*, Fort Worth, Texas.

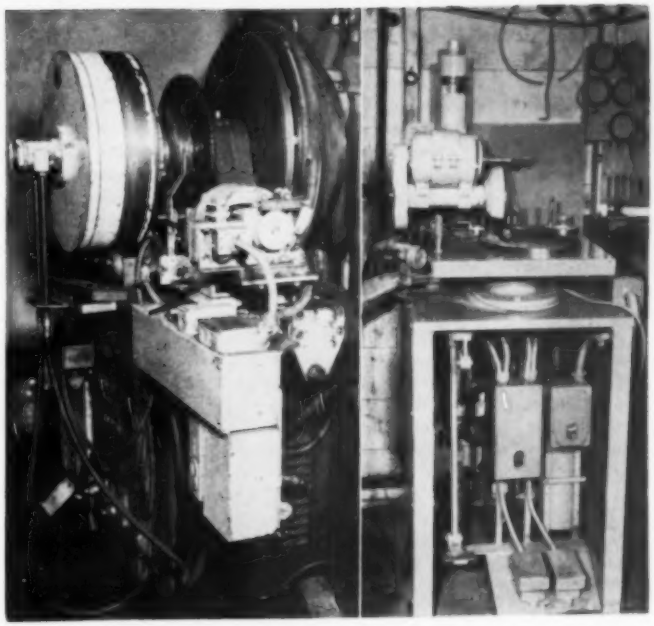
Slotting machine, for milling slots in ventilated type oil rings, was one of the slowest operations in the plant and one of the most critical bottlenecks. Hand-operated machine, previously used, milled only one slot in one ring at a time.

New machine (left) uses a standard hydraulically operated production milling machine as a base. To the table, Double Seal Ring added a large air cylinder for clamping the rings and an indexing device. Note the "finger" in the center of the illustration. This rides on small index plates which control the number of slots to be milled in the rings.

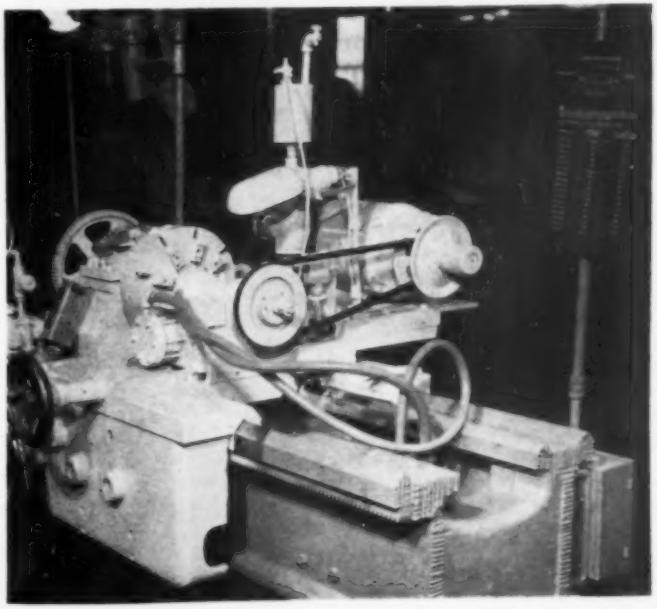
In the foreground is a magnetic brake to positively lock the indexing device instantaneously. Control of the entire cycle of operation is through micro-switches and solenoid valves.

The end gap grinding machine (right) for accurately cutting the gap in rings, is probably the outstanding machine in savings it effects in the production improvement program at Double Seal Ring Company. Operation, previously accomplished by a trial-and-error method, made for slow progress and considerable scrapping of rings in the last stage of manufacture.

New machine (right) has automatic controls which virtually eliminate errors. Band lying on table is set for the proper diameter ring by use of a master ring. Operation of one foot lever causes two fingers to push the ends of the ring outward against the band with a uniform 25 psi. When this pressure is reached, a clamp automatically holds the ring and the fingers "get out of the way." Then, by foot operation, a high speed grinding wheel is passed over one end of the ring cutting it to exact size.



Stepping machine is used for milling recesses in the outer periphery of Double Seal's sealing type rings. Previous units had been strictly special purpose and manually operated. An old lathe bed was cut off and used as the base for the machine. A chuck which holds the ring is rotatable through 120 degrees pneumatically. A variable speed transmission feeds an end mill in, around, out, and back to start automatically. A second variable speed transmission controls speed of rotation of the end mill so proper cutting speed can be obtained for different diameter end mills.



standard high production lathes and other standard production equipment . . . because these machines would not adapt themselves to quick, economical setups for very small orders. In view of the fact that we are manufacturing piston rings from one to approximately 96 in. in diameter, each machine has to be quickly and broadly adjustable for various ranges of sizes."

At first Double Seal tried to have tool contractors come into the plant and design the special purpose machines needed to produce a better piston ring more economically. Soon, however, this method was discarded as too slow and expensive — because of the outside designers' unfamiliarity with Double Seal's products and problems.

So that the designers might have

opportunity to study the company's manufacturing processes in all their details, Double Seal set up its own machine design department, with fulltime personnel.

"Another advantage of this method," says Hoyt, "was that it gave us greater flexibility in design—in that on many occasions when a tool or machine was partially designed, we found it possible, by making progressive changes, to adapt the machine to a broader use than origina.ly intended."

To eliminate the possibility of designing machines which would not do the right job, a control board was set up. The board members—Double Seal's works manager, process engineer and chief engineer—held meetings during the process of design and gave their joint approval of various steps in design of a machine before detailed drawings were made.

As new machines—both the specially designed and the standard—were installed in the plant, other production factors were altered to "fit" them. Engineering specifications were revised. Manufacturing and inspection standards were raised.

For examples of the results achieved, consider the seven most important unique machines designed and built under the PPI program: 1. Peening machine. 2. Snagging machine. 3 Deburring machine. 4. End gap grinding machine. 5. Slotting machine. 6. Stepping machine. 7. Rolling machine.

Briefly, the ways these machines fit Double Seal's peculiar production needs are:

1. Peening machine, for peening the inside of piston rings to create uniform outward-push tension in them. The new machine requires no auxiliary equipment so that it may be used to peen various sized rings. It is easy and quick to load and may be easily and quickly changed for peening rings of different diameters and widths. In comparison, one type of high production peening machine requires auxiliary equipment for various sizes of rings, and some 28 minutes are necessary to change over the setup from one size ring to another. The latter machine was not thought economical for use in Double Seal's plant, where the average order for rings of a particular size and type is about 15 units.

Also, the Double Seal machine has innovations which help keep the rings from warping and give a more permanent tension than ordinary methods of peening.

2. Snagging machine, for removing scale from the metal castings from which rings are manufactured. Previously the scale was removed by a hand operation. Double Seal has found that this machine not only does a previously difficult operation better and more quickly, but results in savings by leaving cleaner surfaces for locating and machining.

3. Deburring machine, for removing burrs and sharp edges from all machined surfaces. For many years this operation, carried on entirely by hand, was tedious and costly. The first deburring machine built under the program will handle rings up to eight inches in diameter.

"Also," says Hoyt, "we have concluded that this machine works well enough and provides sufficiently great savings in man time that we will proceed to build a machine for larger rings."

4. End gap grinding machine, for accurately cutting the gap in rings. Double Seal engineers say they believe this will be the outstanding machine—in savings it effects—in the PPI program. Previously the operation of grinding the end gap in a ring had been done by a trial-and-error method made for a slow process and considerable scrapping of rings in the last stage of manufacture. Automatic controls on the new machine eliminate virtually all possibility of error.

5. Slotting machine, for milling slots in ventilated type oil rings. The hand-operated machine previously used for this operation in the Double Seal plant milled only one slot in one ring at a time. This milling was, says Hoyt, "one of the slowest operations in our plant and one of the most critical bottle necks."

By being fully automatic in operation and milling several rings at one time, the new machine has removed the bottleneck. The machine is readily adjustable for milling different numbers of slots in rings up to 22 in. in diameter.

"The beauty of this machine," Hoyt declares, "is that, after loading, the operator merely pushes the button and then forgets the machine until the full load of rings is completely slotted. This leaves him free to load or operate other machines. We gain considerable man hours because we are cutting from four to eight rings simultaneously and because the operator is available for other work during the cycle."

6. Stepping machine, for milling recesses in the outer periphery of Double Seal's sealing type rings. Previous stepping machines used by the company had been strictly special purpose and manually operated. The new machine originally was intended not necessarily to speed up production but mainly to replace a worn-out manually operated machine with an automatically operated machine. Use of the new machine, however, ultimately will increase production about 40 per cent, believes Hoyt.

7. Rolling machine, for rolling steel rings out of rectangular steel stock. Some of these rings vary in cross section up to about one inch square.

Previous machines used in rolling these rings—because of lack of close control—presented problems in obtaining round rings.

The rolling machine designed under the PPI program is husky and has full ball-bearing adjustable rolls and a variable speed motor with a finger-tip control for speed variation both forward and reverse. This machine is simple to use and gives excellent results.

"By making special adapters," says Hoyt, "we are also able to roll thin expander rings out of material perhaps as thin as .031 in. for use as expanders behind certain types of piston rings."

Other Improvements

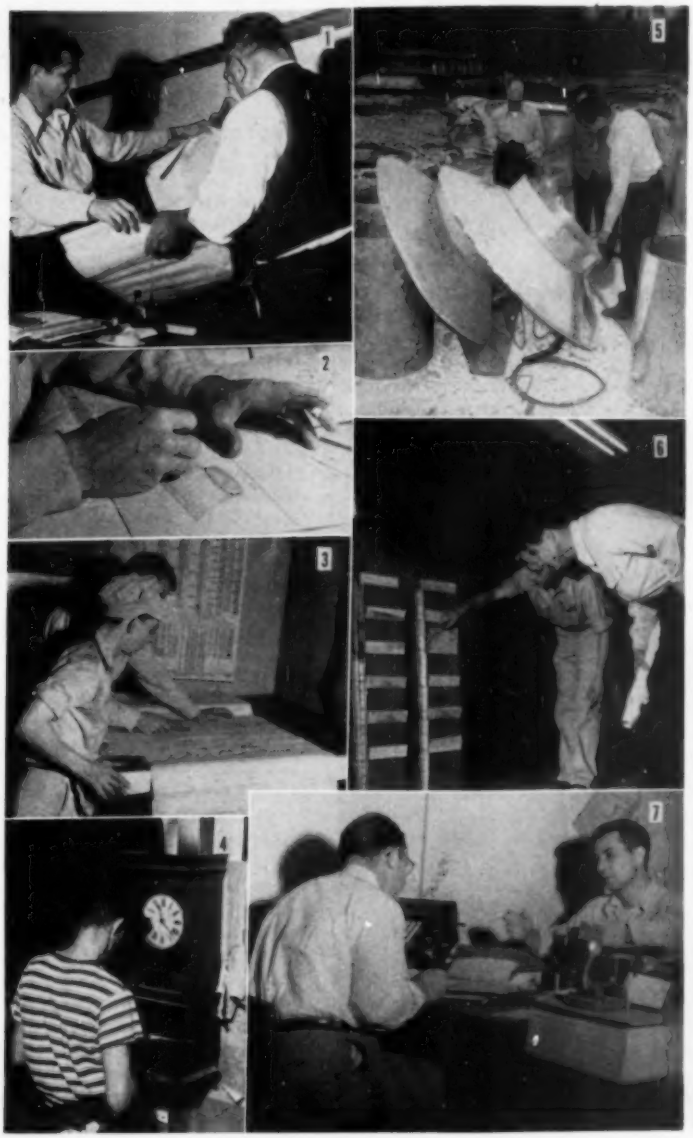
As these and other projects of phase one took shape, desirable results also were appearing in phase

(Continued on page 202)

Cost Accounting Made Accurate by Ticket Method

CONVENTIONAL cost accounting methods are not applicable at National Blow Pipe and Manufacturing Company, New Orleans, La., because of the variety of products made. "Many of our lines are not standard," explains president Redding Sims. "Each item is somewhat different, when you turn out blower and ventilating systems as our plant does. But it is as necessary for us to know exact costs as it is in any other operation."

The plan shown by the accompanying picture sequence solved the problem. It is based on use of tickets, which show not only materials, but even single minutes of labor — and whose labor. As each job is completed, company accountants can quickly "cost" the work.



1—Job begins with a conference between W. S. DeVaughn, vice-president and production superintendent and Redding Sims, president, to outline day's production.

2—DeVaughn checks specifications, makes out separate tickets for each individual operation.

3—DeVaughn and foreman Joseph Charrier check tickets, determine schedules and make assignments.

4—Labor is accounted for on the tickets. Each new step is recorded in and out, using time clock for accurate labor cost record.

5—Materials used in operations, as well as labor, are accounted for on the tickets.

6—Tickets are filed beside time clock. A quick reading gives the foreman knowledge of progress throughout plant.

7—On completion, tickets are turned over to company accountant who uses them to determine cost of each job.

Section 2

Controls and Distribution

Fuses clear the circuit and only the motor is out of action . . feeder units—new capacity added without shutdowns . . automatic blenders . . weatherproof controls for outdoor power plant operation . . . flow tubes

Case 3—Georgia Paper Mill

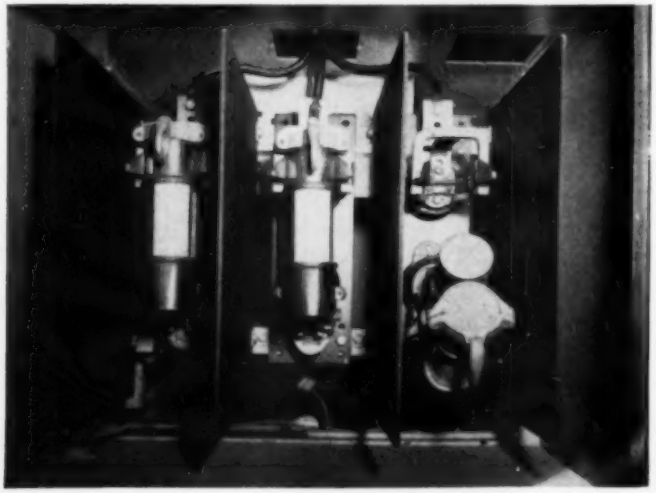
Current Limiting Fuses Cut Maintenance

THE large amounts of electrical current generated and used by the modern pulp and paper mills can cause a great deal of damage to the electrical distribution system when motor winding failures occur.

Up until current limiting fuses were installed, this was the case at Union Bag & Paper Corporation's large mill at Savannah, Georgia.

The plant's 2300 volt system, which distributes between 40 and 45 thousand kilowatts of power throughout the plant, is equipped with approximately 300 high voltage electric motors. At one time the only breaker of sufficient interrupting capacity between these motors and the power generating plant was on the main power line leading out of the powerhouse. When a short circuit in one of the motors occurred, this main feeder breaker opened to stop the current, but it stopped all other motors on the feeder as well, and many times before the breaker could open the current reached very high values seriously damaging the motor's starter and several adjacent starters. This meant that whenever the plant suffered a high voltage motor failure a considerable part of the mill would be down until repairs could be made to the starters, a matter of several hours.

Three of the current limiting fuses, two in a closed and one in an open position, in a 400 hp motor cubicle.



In 1941 Union Bag became the first paper mill to install the new current limiting fuses in its electrical system. The fuses were placed in the line leading to each of the motors in the plant's 2300 volt system. In case of a motor winding failure, the fuses limit the current and clear the circuit, and the individual motor—not the entire system — is put out of action.

The fuses are applied only after careful study of the characteristics of the motor involved. A size is selected which will not blow unnecessarily on high overloads or locked motor conditions.

No disassembly or assembly work on the fuses is required, and they are easily removed and replaced in a few seconds by means of a special switch hook. An indicator in the lower end of the fuse reliably indicates whether or not it has blown.

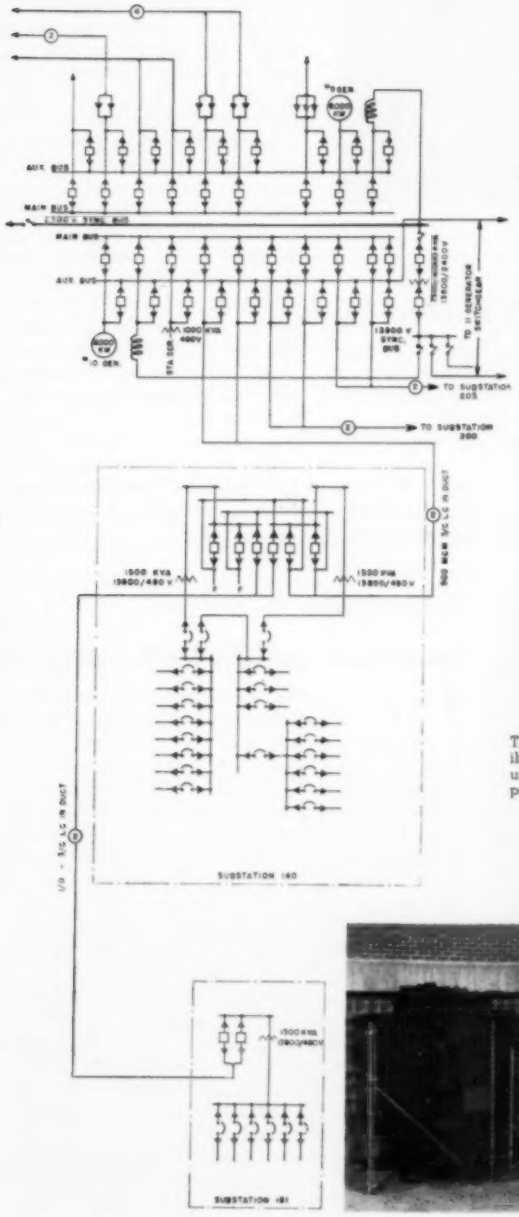
How a Double Bus System Serves Tennessee Eastman

THE Tennessee Eastman Company at Kingsport, Tennessee, Division of Eastman Kodak Company, uses a double bus system in its main power house with main and auxiliary breakers. This type of system was started in 1935, has proved to be very flexible, and has permitted the addition of new feeder units and new generating capacity without shutdowns. The rapid growth of the plant and its accompanying large increase in electrical load has required a flexible and dependable arrangement.

The main bus units are located on the operating floor and the auxiliary units are on the floor directly below. Bus units are of the metal clad drawout type with 150 mva interrupting capacity unit for 2300 volt busses and 250 mva for the 13,800 volt units.

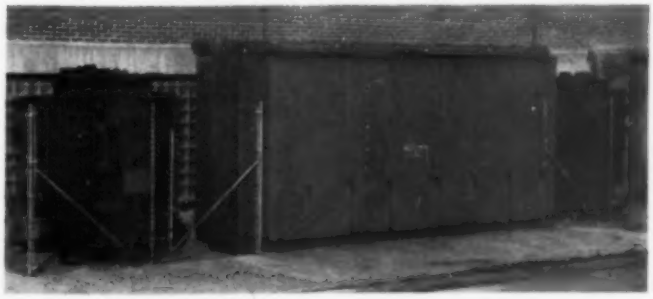
Since large continuous processes require adequate feeder capacity and continuity of service, parallel feeders are used with selective primary oil circuit breakers in the main unit substations. This arrangement not only provides a very flexible feeder system but allows periodic inspection and testing of the feeder cables and breakers.

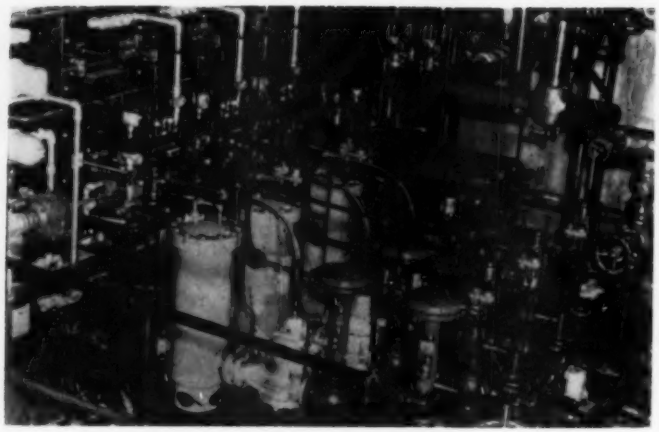
The single line diagram shows two generator bus sections in our main power house, a tie between our 2300 volt and 13,800 volt systems and a parallel feeder arrangement to substations 180 and 181.—*A. C. Crymble.*



This double bus arrangement provides a flexible, dependable feeder system, facilitates regular inspection and testing of equipment, and permits addition of units without shutdown.

A compact 3000 kva outdoor substation arrangement showing 13.8 kv switchgear and transformers at Tennessee Eastman Company.





Case 5—Louisiana Oil Terminal

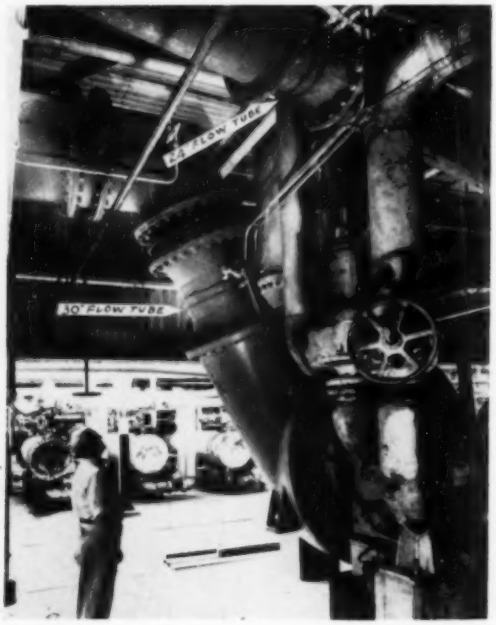
Storage By-Passed by Automatic Blenders

ST. ROSE Terminal of the Cities Service Oil Company is primarily an export terminal whose function is to blend small quantities of a variety of products for lubricating oil service. The operation involved a need for a great deal of small storage space which was not available. The fact that the plant turned out a large number of small volume blends dictated the need for some method of permitting the operators to blend only the amounts needed at the times required.

After analyzing the job conditions % Proportioneers, Inc.% presented a proposal for one of their continuous automatic Lube Oil Blenders whose design was such as to permit accurate compounding of blends as low as five barrels and also permitted these blends to be made directly into the barrelling equipment. This method of operation eliminated the need of storage facilities.

The blending equipment has several suitable design features including extreme flexibility of production rate and component ratio, provision for recirculating components prior to putting the blender on stream so as to permit accurate checking of the ratio settings, positive volume metering of all components and the ability to handle additives of any type in the extremely small quantities which are normally required. Specialized calibration procedures were worked out for the small additive quantities and a pneumatically operated Treet-O-Unit metering pump is used for handling the additives.

After the oil is blended it is passed through a two-stage mixer where the various components and additives are thoroughly mixed prior to discharging to the packaging operation.



Case 6—Southwestern Refinery

Flow Tubes Installation Saves Space

THE accompanying photograph shows installations of two Foster Engineering Company flow tubes in the catalytic cracking units of a Southwestern Oil Refinery. These tubes are measuring air used in reactivating the catalyst.

The 30 in. flow tube has a 23.9 throat (D/d = 1.25). It is 30 in. long face to face. It delivers a differential of 10 in. of water for a maximum flow of 39,000 standard cfm of air at 137 F and 3.5 psig. The unrecovered head loss in this tube at maximum flow is 1 in. of water.

As may be seen from photographs, these tubes have been installed with minimum straight entering runs. The 30 in. tube is installed immediately following the blower discharge flange with a 90 degree elbow downstream of the tube. Even in these extreme locations, the tubes are performing satisfactorily. Periodic checks indicate that they are checking blower manufacturer's characteristic curve within an accuracy of plus or minus 2 per cent. The saving in space and equipment as compared with that necessary to provide necessary straight entering runs for conventional head meters is apparent.

Case 7—Southern Textile Mills

Conditioner Control Speeds Wool Process

SAVING weeks of processing time, a number of Southern textile mills have adopted a new use for Foxboro-controlled yarn conditioners. The new method is based on the fact that a period of rest for the fibers after blending and carding, but before spinning, will improve quality and reduce fiber breakage. However, instead of the 3 to 4 weeks necessary for best results at room temperatures, these mills give the carded or "top" form fibers a fast-rest with steam in only a few minutes under carefully controlled elevated temperature and humidity.

Control may be automatic or semiautomatic. Conditioners under automatic Foxboro control use a Wet and Dry Bulb Humidity Controller.

The operator initiates the automatic fast-rest cycle by simply pushing the "start" button. The system closes a damper to recirculate air within the conditioner; opens the steam valves to the heating coil and steam spray lines; and starts a blower. When the wet bulb control point is reached, the steaming timer starts. At the end of the timed period, the heating valves close and the damper admits cool air into the conditioner. The cooling timer then operates, after which the blower stops, the end-of-cycle signal light is turned on and the fast-rest process is completed.

Treatment reduces kinking and twisting, and relaxes the fibers for easy handling. Production benefits include: improved quality, less fiber breakage, decreased treatment time and reduced costs.

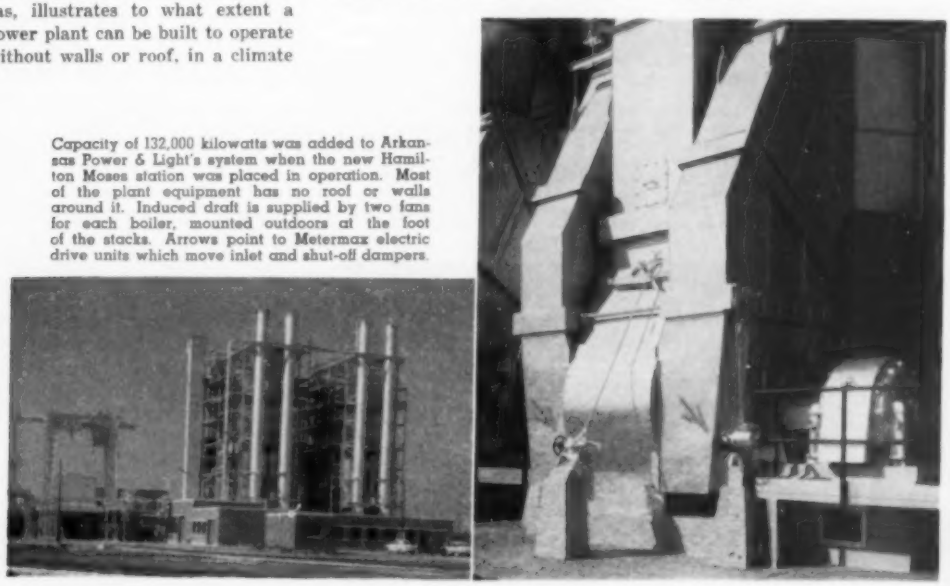
Case 8—Arkansas Power Plant

Motor Driven Controls Aid Outdoor Operation

THE Hamilton Moses Steam Electric Station of Arkansas Power & Light, at Forrest City, Arkansas, illustrates to what extent a power plant can be built to operate without walls or roof, in a climate subject to occasional snow and freezing. Boilers, air heaters, economizers, forced draft and induced draft equipment are all outdoors. Only the structural steel framework surrounds the boilers and stacks; all exposed equipment is designed to function without additional protection against the elements.

Outdoor construction places this added requirement on the combustion control equipment — it must move valves and dampers with complete reliability in all kinds of weather, for both safety and efficiency considerations. Specifications that read "shall operate outdoors at temperatures from 0 to 100 F" present no problems for Metermax Control. The reason: Metermax uses *electric-motored* drive mechanisms to move dampers and other controlled elements; can therefore be mounted wherever they are needed, without weather shelter, steam jacketing or other precautions. There are no tubing runs or pilot valves which might freeze in winter.

Here are some of the principal weatherproofing features standard on all L&N drive units for outdoor service. Electric motor and junction box are watertight. Electrical connections between the junction box and limit switch housing are run in solid conduit. Check-valve breathers are provided on gear housings.



Capacity of 132,000 kilowatts was added to Arkansas Power & Light's system when the new Hamilton Moses station was placed in operation. Most of the plant equipment has no roof or walls around it. Induced draft is supplied by two fans for each boiler, mounted outdoors at the foot of the stacks. Arrows point to Metermax electric drive units which move inlet and shut-off dampers.

Section 3 Refrigeration and Air Conditioning

Production expansion into basement with low head room presents design problems . . direct expansion ammonia coils absorb shock loads in synthetic rubber plant . . process conditioning for 45 acre work area

Case 9—North Carolina Textile

Conditioned Air for Process Control

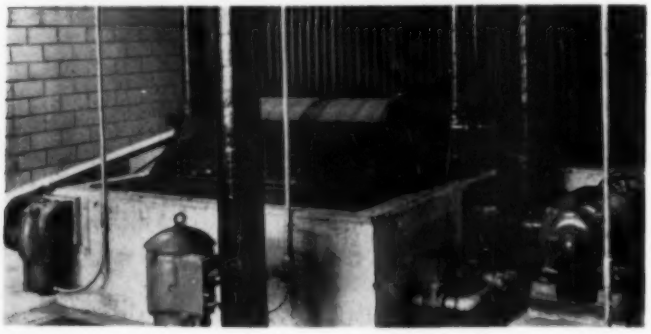
WHEN increasing the weaving capacity of the Cone Mills Revolution Rayon Plant in Greensboro, N. C., several problems involving low head room required careful consideration.

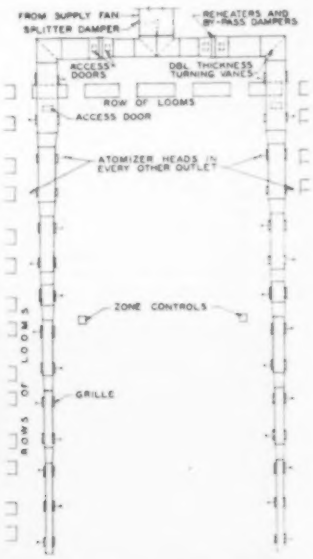
Expansion was essentially an extension of operation into the basement of a building where all processing had been on the main floor level. There, refrigeration capacity for chilled water was already available.

Since satisfactory handling of synthetic yarns is helped by close control of atmospheric conditions, the basement addition was designed for refrigeration in summer and heating in winter to maintain conditions of 80 to 85 F dry bulb and 55 to 65 degrees relative humidity the year round.

Apparatus room wall construction incorporates 8 in. common brick, 2 in. foam glass, and a glazed tile interior surface. Concrete floor was poured on stone fill with suitable floor drain and overflow connections. Provisions were made for

Apparatus room showing dehumidifier, recirculator and spray pump. Air washer has a galvanized iron casing, two banks of spray piping and a slushing header for intake baffles, three-bend stainless steel incoming air baffles and six bend stainless steel eliminators. Double suction Buffalo pump is used for washer water circulation; its intake is from the concrete washer tank through a self-cleaning rotary lint filter of Buensod-Stacey manufacturer. This is a slowly rotating screened metal cylinder with pump intake inside. Flushing nozzles wash lint adhering to the outside into collection baskets.





Layout of air conditioning ducts in the basement weave room of Cone Mills Revolution Rayon Mill in Greensboro, N. C.

Weave room after completion of air conditioning installation but before completion of building structure. Basic automatic control starts with a recording type dew point controller with adjustable sensitivity and automatic reset features. Room controls are mounted in aspirator cabinets with dry bulb temperature and relative humidity recorders. Cabinets are suspended from springs to isolate them from building vibrations.

ample clearances around all apparatus for inspection and maintenance.

Chilled water for cooling is taken from the existing refrigerating service and chilled water lines, cork insulated, are brought into the intake side of the washer room. All connections and control valves are in easily accessible locations. When on chilled water service, overflow from the washer is returned to the cooling system by an Aurora vertical pump. On evaporative cooling, filtered makeup water is added through the recirculating system of the main air conditioning system so treatment can be provided for all circulating water as required.

The outside air and return air dampers are of opposed action type, controlled by a single air motor with mechanical connection between the recirculating and inlet dampers.—*Francis A. Westbrook.*

Installation was designed by *J. C. Harrison*, consulting engineer of Spartanburg, S. C. *Buensod-Stacey, Inc.*, engineering contractors of New York and Charlotte, N. C., handled the installation and Cone Mills' construction forces made the building changes.

Case 10—Louisiana Synthetic Rubber Plant

Cooling System Design Cuts Reactor Time in Synthetic Rubber Production

Temperatures in reactor used to "run away" before brine system could take care of sudden load. Now, direct-expansion ammonia coils, pneumatically controlled, absorb shock loads.

THE synthetic rubber being produced in the largest quantities today is known as GR-S, which means Government controlled Rubber-Styrene. This has excellent aging and water-resistance qualities.

GR-S rubber was originally produced by a "hot" process, the temperature in the reactors being 122 F. By 1948 several of the Government-owned plants had been devoted to making "cold" rubber, at 41 F. The new method makes a rubber that is much stronger and more resistant to abrasion.

Briefly stated, GR-S rubber is compounded by mixing a soap solution with Butadiene: Styrene, an activator, a modifier, and an initiator, in an enclosed vessel called a reactor. The standard reactor holds 3750 gallons, is lined with glass, and is equipped with a jacket on the outside and two sets of stirring blades on the inside. The inside diameter is 7 ft, 6 in. and the height 12 ft, 7 in.

Processing Problem

The time required for processing a batch in the reactors, amounting to nine hours each, has been the limiting factor in volume production. As soon as the initiator is added, the mixture starts to generate heat, in amounts up to 600 Btu/lb, according to an article published in *Chemical Engineering Progress* by *M. W. Larson.*

Unless the heating effect is controlled, the mixture tends to effervesce, and the pressure to rise. For this reason the old practice was to charge each reactor until only partly full. When the viscosity of the latex reaches a maximum, toward the end of the reaction, the

heat-transfer coefficient is poor. Early methods using cold brine in the jacket tended to freeze out the moisture in the solution.

Before entering the reactors, the ingredients are precooled in shell vessels through the tubes of which cold calcium chloride brine is pumped. To the heat of the reaction and the precooling load mentioned above must be added the heating effect of the agitators and the brine pumps, leakage through insulation, and other losses such as blowing out the reactors with steam when they are emptied.

The improved cooling system, designed by Frick engineers for synthetic rubber processing vessels, involves the use of direct-expansion ammonia coils inside the reactors. Coils are of the vertical type, and although they involve a large surface they are all inserted through a manhole in the top of the shell.

New Cooling System

Frick engineers within the last year have developed an improved cooling system for these vessels so effective that reaction time is cut to less than half the former nine hours. This improvement may double the production of synthetic rubber in this country.

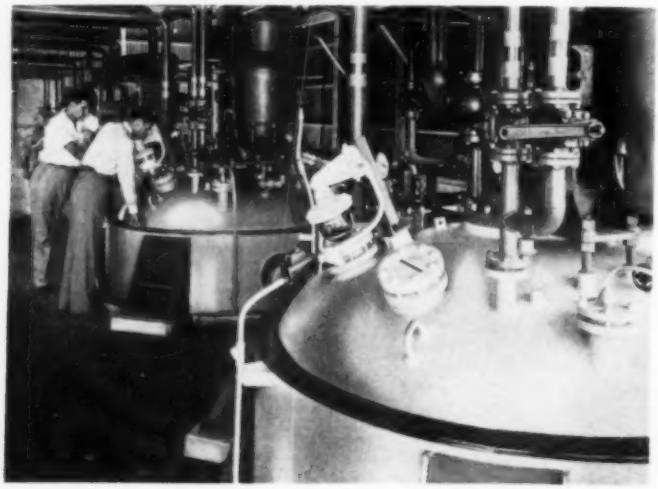
The Frick method, on which patents have been applied for, involves the use of direct-expansion ammonia coils inside the reactors. These coils are of the vertical type, and although they involve a large surface they are all inserted through a manhole in the top of the shell. A critical feature of the design is the control which maintains a uniform temperature throughout the reaction; this allows faster feeding of the initiator, with subsequent speeding-up of the process. The ammonia gas generated in the cooling coils has such a low velocity that the pipes are kept flooded with liquid, and the heat transfer rate is exceptionally high. The control is pneumatically operated; the temperature charts on the recording thermometers make very good circles.

Quick Process Control

A vital feature of the new system is the sensitive and quick control which it affords. When they start working on one another, the chemicals in the reactor at times will generate heat so fast that the temperature will "run away" before the usual brine system can be adjusted to take care of the sudden load.

On the other hand, direct-expansion ammonia coils, under the regulation of pneumatically controlled valves which can vary the back pressure and the temperature instantaneously, will absorb shock loads with ease. The temperature of these coils can be dropped 15 or 20 degrees in practically no time at all, enabling the operator to retain control of the reaction. The coils have such big interior volumes that they are largely filled with liquid, normally, and are instantly responsive to change of load. If, for example, spontaneously generated heat from the rubber reaction is suddenly released, the gas formation and velocity in the vertical coils will temporarily become very rapid, promptly carrying away the heat.

So vital was the need for a way to speed up the reactor time that these vessels were installed in a long row, sufficient to insure a continuous process. An hour or more is lost in filling and emptying each reactor; a vacuum has to be created to eliminate excess absorption of oxygen.



The new Frick cooling system was first tried with a full-sized installation in a reactor in the Copolymer plant at Baton Rouge, La. This test was so effective that scores of identical coils have since been ordered for this and other GR-S plants, including those at Borger, Texas, Louisville, Ky., and Naugatuck, Conn.

The plant now being built at Louisville is for the Kentucky Synthetic Rubber Corp., and will have Frick refrigerating equipment throughout. This will comprise 24 sets of cooling coils for the reactors, plus four precoolers for ingredients; four 14 by 12 compressors, each with four cylinders and a synchronous motor of 600 hp, multipass condensers, 42 in. x 18 ft; a huge receiver 48 in. in dia; a 5¾ in. by 4 in. pump-out compressor, 12 in. main suction lines, special gas and oil separators, cut-outs, controls.

Case 11—Georgia Aircraft Manufacturer

Air Conditioning 45 Acre Work Area

THE Lockheed Aircraft Corporation, Georgia Division, near Marietta, Georgia, completely air conditioned its main production plant to insure dimensional stability of aluminum parts during the fabrication and assembly of aircraft.

Air conditioning was needed to enable the manufacturer to hold the temperature constant throughout the production area so the close tolerances required in aircraft manufacturing would not be endangered by the expansion or contraction of aluminum caused by temperature changes.

The year 'round air conditioning system consists of a total of 7375 tons of air conditioning equipment, 60 per cent of which was made by Chrysler Airtemp. Boilers capable of generating 350,000 lb/hr, and the air handling units supply a total of 3,830,000 cfm to the 2,196,000 sq ft of production area and 216,000 sq ft of mezzanine space.

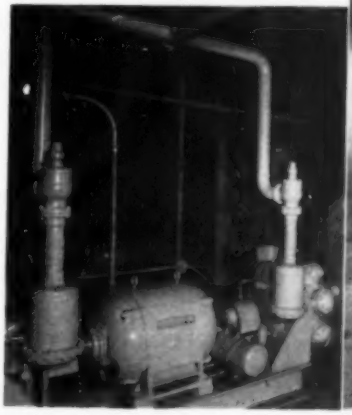
The air conditioning equipment is installed in the penthouses under the roof and 40 ft above the working area. Air is circulated through vertical diffusers, except in the mezzanine area where it is handled through a horizontal duct and register system.

One hundred and one compressor units, which make up the system, are installed in 70 penthouses. Also in each penthouse is an evaporative condenser and air handling unit to complete the air conditioning system. There are 21 miles of steam pipes leading to the air handling units which are equipped with steam coils. More than 5600 20" x 20" filters clean the incoming air.

A temperature of 70 F, with only a 2 degree variation, is maintained in the 45 acres of production space even with an outdoor temperature range from 20 F to 90 F.

An interior view of the plant showing fuselage sections of B-47 jet bombers being assembled. The doors at upper right lead to the penthouses, shown in inset, that house the air conditioning equipment. The duct work coming from the air handling units and leading to the overhead air diffusers can be seen, upper center. There are 40 miles of catwalks leading to the penthouses. "Squirrel cages" on the roof take in fresh air and exhaust stale air. An economizer system here varies the amount of fresh air brought in, according to the outside temperatures. For example, if the outside temperature is 70 F, 100 per cent outside air is brought in and the air conditioning equipment automatically shuts off.

This interior view in one of the 70 penthouses shows a 75 hp Chrysler Airtemp compressor unit. There are 101 compressor units at work in the plant. One of the 70 air handling units used to supply a total of 3,830,000 cfm is shown at right.



More Information Available

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N. E., Atlanta 5, Georgia. There is no obligation.

Section 4 Power Transmission

Combination flexible coupling and automatic clutch . . drive overhaul and maintenance techniques . . fluid drives for crane operations . . smooth and gradual starts with hydraulic coupling . . chain lubricant

Case 12—Georgia Chemical Plant

Controlled Torque Coupling Pays for Itself in One Day

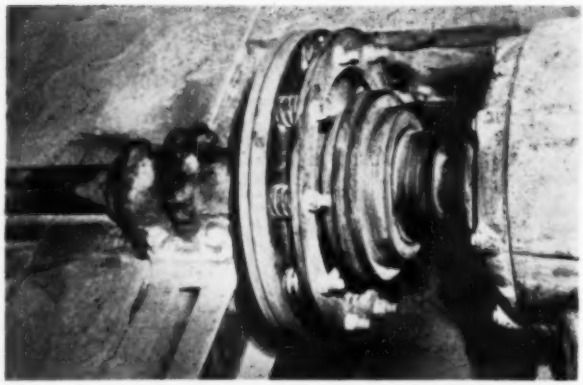


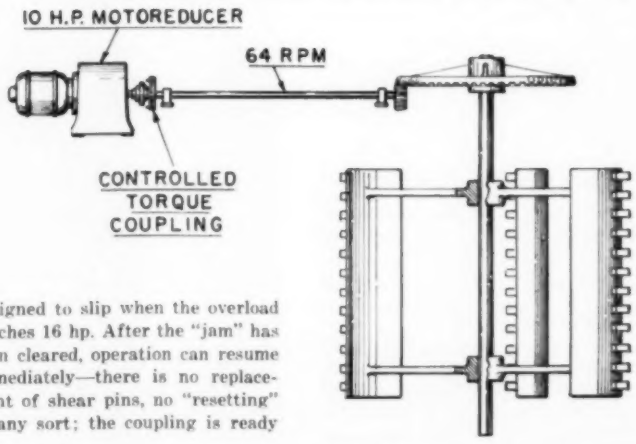
Fig. 1

THE East Point, Georgia, plant of International Minerals & Chemical Corporation manufactures superphosphate fertilizer. In the process, sulphuric acid is mixed with phosphate rock dust, eventually solidifying as it becomes superphosphate. After solidification, the "den cutter" starts cutting into the solid mass. At times during the cutting operation, "cave-ins" occur which may jam the cutters and damage the mechanism — unless power is cut off instantly. A Controlled Torque Coupling manufactured by The Falk Corporation of Milwaukee, Wisconsin, is used to protect the machinery. (Figure 1.)

This coupling (see Figure 2) is designed to slip when the overload reaches 16 hp. After the "jam" has been cleared, operation can resume immediately—there is no replacement of shear pins, no "resetting" of any sort; the coupling is ready to go. Between "cave-ins", the torsional resilience of this truly flexible coupling cushions the impact of less-than-critical overloads, thus saving further wear-and-tear on the system.

Fig. 2

ELEVATION VIEW - DEN-CUTTER DRIVE.



Controlled Torque Coupling—A Combination of Flexible Coupling and Automatic Clutch

Figure 3 illustrates the construction and operating principle of the Controlled Torque Coupling. The power from the driving motor is transmitted through the Falk Steelflex resilient coupling (A) to the torque sleeve (B). The torque sleeve (B) has friction lining (C) on both faces. These linings engage the FT hub (D). When an overload

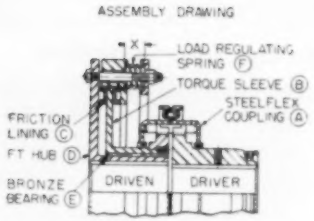


Fig. 3

occurs, the coupling and torque sleeve continue to revolve around bronze bearings (E). The FT (or driven hub) remains stationary until the "jam" has been broken and normal operating conditions restored.

And here's the "controlled torque" feature — the pressure against the friction lining is regulated by the load regulating springs (F). This mechanism can be set to provide slippage at a given load, merely by setting distance "X" to a predetermined measurement given on an adjustment chart furnished with each coupling. The clutch mechanism adjustment is constant so it is not necessary to reset the mechanism when the overload condition has been eliminated.

Case 13—North Carolina Finishing Plant

Overhaul and New Drives for Processing Ranges

COMPLETE overhaul of two processing ranges was recently accomplished during the annual 10 day vacation by the maintenance force of a North Carolina textile finishing plant. Replacement of several complete units, mechanical overhaul of others, and realignment of the entire ranges was completed, as well as extensive changes in the drives of both.

One a-c drive, consisting of one slip ring motor and a combination of variable speed transmissions and roller chains, was replaced entirely by a new Reliance Electric & Engineering Co. d-c drive comprised of a motor generator set and 10 d-c variable speed motors. Automatically regulated acceleration and deceleration, automatic tension control, and motor selection by a central panel of selector switches operating magnetic contactors are the leading operating features of this drive.

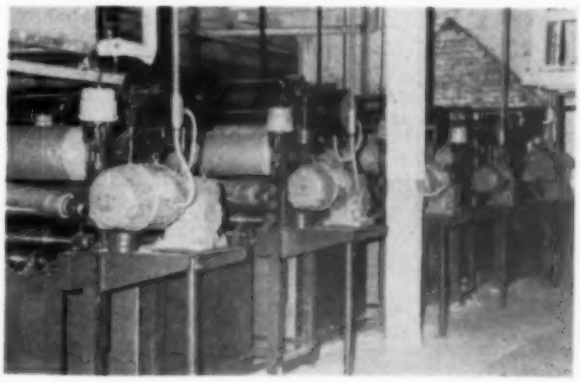
Mechanical changes on this same range were extensive; seven washers with weight-loaded squeeze rolls were replaced by five washers with Morrison Machine Co. air-loaded squeeze rolls of 5 and 10 ton capacities, the new rolls being driven by d-c right-angle gear motors. A group of 40 dry cans was divided into two sections, each section being driven by a d-c gear motor. The five new washers installed were designed and built by plant personnel and incorporate features of design not available in any known washer on the market.

The second range was already equipped with d-c variable speed drive, but used manual disconnect switches located close by the individual motors. On this particular installation considerable trouble had been experienced in the past with corrosion of the switches and conduit and condensation within the conduit runs. To correct these conditions, corrosion-resistant conduit and Versatol Geoprene insulated wire were installed for all motor lead and control lines, and the manual disconnects were replaced by a system of selector switches on a central panel and magnetic contactors.

A set of dry cans on this second range was also divided for driving, four 3-hp motors now driving ten cans each rather than one 10-hp motor driving forty cans. It is anticipated that the reduction in weight of driving chain (from 1½ in. pitch to ¾ in. pitch) will materially reduce the high maintenance formerly experienced here. Variation of surface speed of the cans by use of differential rotational speeds also allows for shrinkage of the cloth as it progresses through the group of cans, and makes for smoother operation. Mechanical portions of new can drives on both ranges were fabricated by Textile Shops, Inc.

The complete installation of the d-c drives would have been impossible in the short time available had not the work been planned in detail and all possible phases of the work accomplished before hand. All control and relay panels were completed prior to the shut down, with selector switches, controlling rheostats, magnetic contactors and similar equipment mounted in place. To expedite wiring on the job, terminal blocks and strips were installed and leads from each controller or relay were run to labeled terminals. This phase of the work was accomplished in the comparative quiet of the plant shop, without interference with the plant processes, and the completed pan-

Five new washers are driven by d-c right-angle gear motors



els were mounted in place during weekend shut downs. Actual work necessary after shutdown was confined to ripping out the old wiring, running new conduit, pulling in new wire, "ringing out" the lines, and connecting to the labeled terminals.—*W. H. Fisher.*

More Information Available

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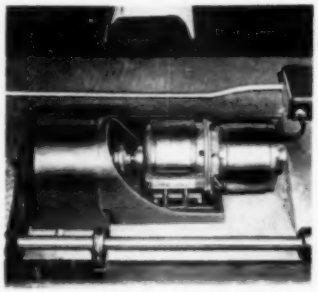
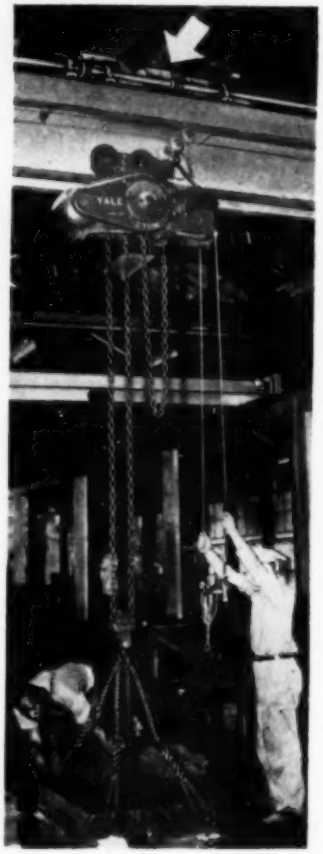
Case 15—South Carolina Machinery Company

Fluid Drive Makes Crane Operate Smoother





THE photographs show one of the traveling cranes in the plant of the Sumter Machinery Co. at Sumter, S. C. Three cranes in this plant have now been equipped with Type TM Gyrol Fluid Drives by American Blower Corp.

The crane in the foundry which handles molding flasks and ladles of hot metal was the one first equipped with fluid drive. This crane travels at about 100 fpm and the fluid drive gives a perfectly smooth start without any jerking—swinging of load is thus reduced to a minimum.

The unit as shown is connected to a gear reducer to give an output shaft speed of about 38 rpm. A chain drive connects the reducer to the counter-shaft of the crane.

There is no mechanical connection between the driving and driven shafts of the fluid drive and power is transmitted by a cushion of oil. This provides an extremely smooth and gradual start.

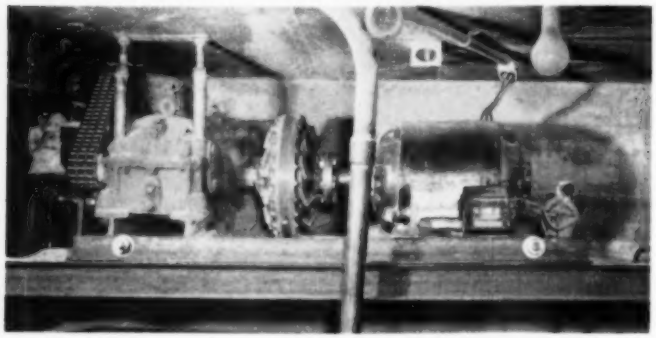
Case 14—Virginia Woodworking

Hydraulic Coupling Reduces Maintenance

THE Lane Company, Inc., Altavista, Va., manufacturers of cedar chests, use a belt conveyor to carry scrap wood to a wood hog. Because metal on the belt causes damage to the wood hog, the conveyor is equipped with a metal detector which automatically stops the conveyor when metal is located on the conveyor belt.

Because of the frequency with which the metal detector found tramp iron and caused the motor drive to stop, and subsequently start again, motor drive shaft life had been short. Therefore a hydraulic coupling was installed to protect the motor shaft in starting and stopping; to permit the motor to come up to speed under no-load conditions; to reduce high starting current; and to take starting jerks off the long conveyor.

Since the installation of the Twin Disc Hydraulic Coupling, drive trouble, with resultant shutdowns for repair, has been entirely eliminated. The conveyor starts smoothly, with the "slip" of the coupling permitting the motor to come up quickly to efficient torque before picking up the load.

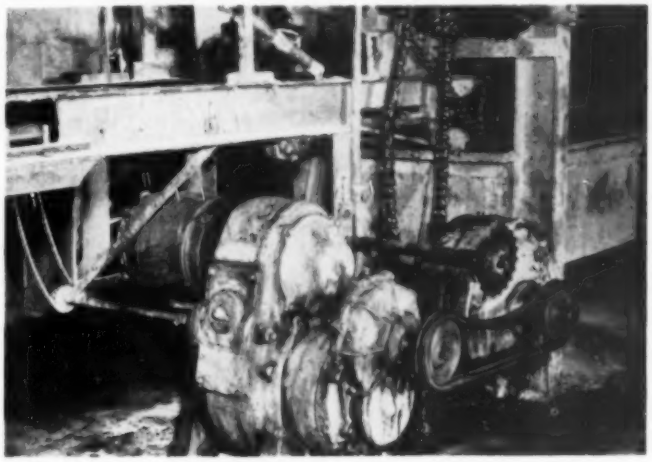


Case 16—Mississippi

Variable Speed Drive Meets Severe Requirements

DISMUKE Tire & Rubber Co. of Clarksdale, Miss., operates 24 hours a day, 7 days a week. One of their big requirements was to find a variable speed drive that would be rugged enough to meet operating conditions, and still be compact enough for installation in the allotted space.

The Speed-Trol manufactured by Sterling Electric Motors, Inc., was finally selected for the job, and according to W. M. Evans, Chief Engineer of the plant, it has done an outstanding job in connection with the manufacture of D & J inner tubes and camelback. He also mentions that Speed-Trol has been selected for comparable service in connection with a recently completed plant expansion. Ruggedness, streamlined and protected design, infinite speed variations, and fingertip control of speed, are features which Mr. Evans states have contributed to the outstanding performance of this equipment under severe operating conditions.



Case 17—Paper Mill

Belting Paper Machines

ONE OF THE largest paper mills in the South has operated its line-shaft driven paper machines without charging a single minute of down-time to the leather belts during the past 15 years. This is a fine record but certainly not a coincidence. In a recent survey, J. E. Rhoads & Sons found that leather belting is giving outstanding performance.

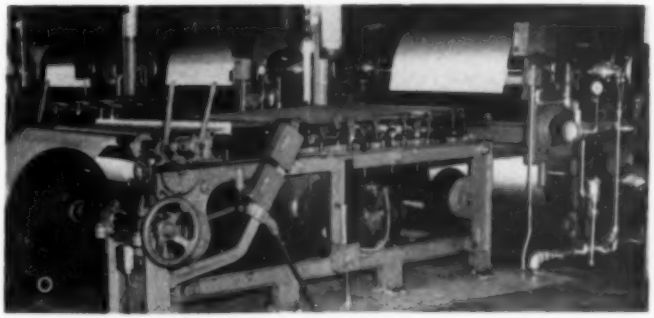
As a result of its findings, J. E. Rhoads & Sons have published a handbook on the application of leather belting in the pulp and paper industry. It explains how to calculate belt sizes to meet the horsepower requirements for each section of the machine. It outlines a step-by-step procedure for installing and maintaining Tannate leather belts on paper machine cone drives.

This handbook, with material never before available to the pulp and paper industry is now being offered by J. E. Rhoads & Sons, to paper mill superintendents, engineers and maintenance men.

Case 18—Carolina Textile Mill

Grease Saves Roller Chain

PROCESSING heat was raising havoc with lubricant, bearings and roller chains in the slasher room of a Carolina textile mill. A main drive chain lasted only eight weeks; cylinder and size-vat roller chains lasted twelve. All-in-all, $1,000 worth of chain was being chewed up each year by nine slashers. Then a specialized grease—with a melting point at 350 F—was supplied by Keystone Lubricating Co. The original coating of the special grease lasted over 30 days, as compared to previous life of 6 or 7 hours. A 10-month checkup showed no new chains purchased and only 3 feet of spare link used for repairs. To this were added savings in quantity of lubricant used and time for application.

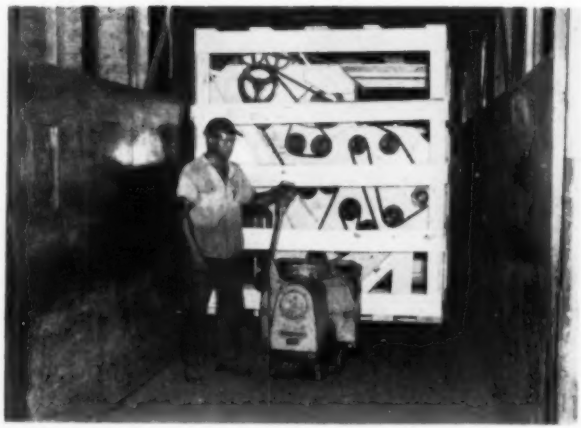


FRICTION causes wear. Better lubrication, better alignment, and better maintenance reduce both friction and wear. See the maintenance section of this issue for additional suggestions.

Section 5

Materials Handling

Six story "ferris wheel" conveyor . . monorail reconditioned . . ash cans and shovels outmoded . . overhead system transports and stores . . fork trucks coordinate material flow . . 3620 ft belt . . handling calcined fluorine weighing 80 lb per cu ft and at 300-400 F.



A completed 4,000-pound cotton gin, carried by an *Automatic Transporter*, is shown in an elevator en route from product storage on the top floor of one of the 15 buildings of Continental Gin Machinery company's Prattville, Ala. plant to the loading platform. Before industrial truck fleet was installed, this move required efforts of a four-man team.

Case 19—Alabama Metalworking

Handling Time Halved Despite Doubled Volume

WE NOW do twice the job in about half the time. That is the estimate of the achievement for mechanized materials handling at the Continental Gin Machinery company plant in Prattville, Ala.

The plant, operated by the largest cotton gin manufacturer in the world, consists of 15 principal buildings and assorted smaller structures of all ages, some dating to 1845. Products are current models of gins, parts for units as old as 50 years, and centrifugal fans.

Continental's handling problem is based on the number and variety of buildings. They are from one to four stories, and are served by elevators and bridges at various corresponding floor levels. Production and in-process storage areas are arranged for the convenience of departments involved, with a central product storage area, for shipping purposes, provided whenever possible.

Routes which material traverses are described by the company as "all over the place." Automatic Transporter driver-led industrial trucks operate indoors throughout the production and storage areas, outdoors on the loading dock, in the plant yards, and on concrete runways and sidewalks built for them between buildings. Foundry, scrap yard, shipping, production, and storage are all serviced by these trucks.

Continental selected as its materials handling mainstay to handle skidloads of many types the plat-

form model Transporter, a battery-powered, driver-led industrial truck made by the Automatic Transportation Company. The fleet now consists of eight Transporters, including one of the new '101' series.

As a result of the innovation, the Prattville plant cites these accomplishments: 4,000-pound loads handled by one man and a Transporter, as contrasted to 1,500-pound loads in the past; 50 per cent faster speed of travel; and 50 per cent saving in round trip time in loading and unloading push trucks. The total saving in time and costs is about two-thirds, despite more than doubling production volume since the manual handling days.

Continental estimates that it handles six and one-quarter tons an hour with each Transporter. Six of the units work an eight hour day, and two, with spare batteries, put in an additional eight hour shift each.

Case 20—North Carolina Textile Mill

Conveyor Saves $25,000 Per Year

THE Firestone Textiles Division of the Firestone Tire and Rubber Co., Gastonia, N. C., saves $25,000 per year in handling beams and box trucks by installing a new conveyor, six stories high. Up to twice as many beams can be handled per day and freight elevators are freed for other duties.

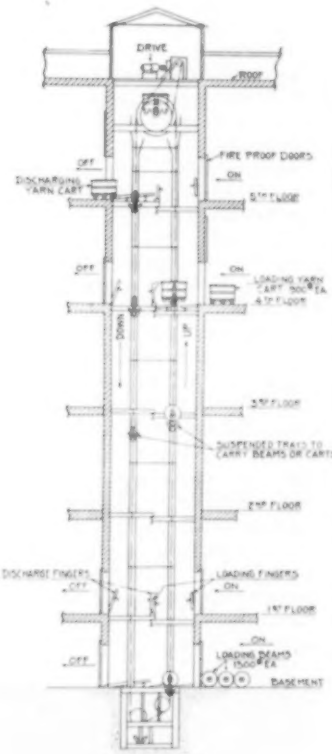
The system was installed specifically to carry 1300 lb beams of rayon to the fourth and fifth floors and to return the empties.

Existing freight elevators were already operating on heavy schedules and the beams had to be handled as best they could over the various shifts. About 50 beams per day were handled on this staggered basis whereas with the new system, 80 to 100 beams are handled in one shift. In addition, the conveyor carries 900-lb box trucks between twisting and weaving rooms.

The conveyor, engineered and manufactured by the Gifford-Wood Co., Hudson, N. Y., is installed in a shaft having doorways on two opposite sides. Doors on one side are for loading, those on the other for unloading. In operation, the conveyor resembles an elongated ferris wheel. "Trays" pick up loads on one side of the shaft and carry them up over the top and down along the other side to the proper discharge floor. Trays are suspended 25 ft apart between two parallel roller chains which travel the length of the shaft. Chain-sprockets are driven at the top of the shaft. Of the six floors, the basement, first, fourth, and fifth are served.

When loading, beams are lined up at the door of the conveyor and pushed onto retractable "fingers" extending out into the shaftway. A tray picks up the beam and carries it to unloading-floor fingers where it is deposited and removed to twisting machines. All other fingers are retracted until other floors are to be serviced.

In order for the Gifford-Wood conveyor to operate, one door must be open on the loading side and one must be open on the unloading side. When ready to start unloading, the attendant at the unloading floor pushes a signal button and the attendant on the basement floor starts the conveyor. Electric-eye controls will stop the conveyor to prevent more than one beam or truck from being deposited at a time.



Schematic diagram of new *Gifford-Wood* "ferris-wheel" conveyor at Firestone Textiles Division of the Firestone Tire and Rubber Co., Gastonia, N. C.

More Information Available

Many of these modern procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case histories in this 5th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

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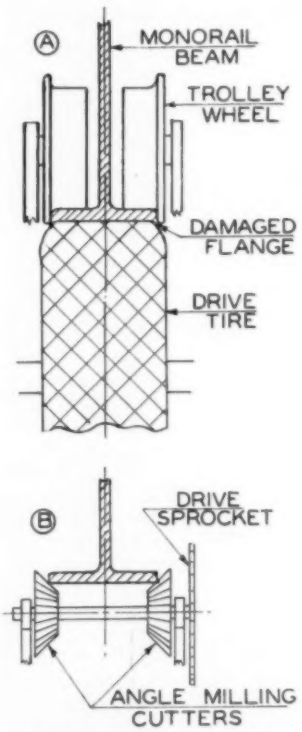
Case 21—Texas Aircraft Manufacturer

Reconditioning Monorail at Convair

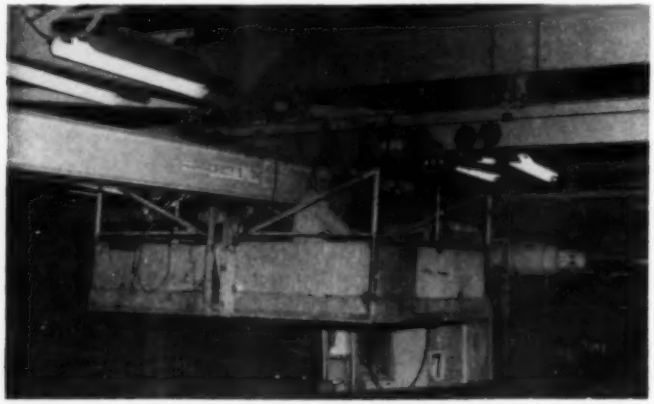
DETERIORATION of the main runway rails on the monorail system used for material handling at Convair, Fort Worth Division during and since the war, caused the plant Maintenance Department to be faced with the problem of replacing or reconditioning some 20 miles of steel rail. Obviously replacement would be very expensive and reconditioning by hand grinding a very tedious job, so some easier and less expensive method was sought.

As shown in Figure 1A the action of the crane wheels on the main rails tends to roll the ends of the flanges downward creating a sharp edge which cuts into and ruins the pneumatic tires which provide traction for the crane. In order to solve this problem shop supervision and Plant Engineering designers conceived a power milling attachment which could be connected to a monorail truck and mill the sharp edge from the bottom flange of the rail. Figure 1B shows the position of the angle milling cutters with respect to the rail.

After considerable experimentation a successful adjustment and feed mechanism for the cutters was constructed together with separate motor drive and convenient quick connectors for mounting the attachment on the crane. Figure 2 shows the milling attachment attached to a crane with the operator conveniently located in a special service cab constructed for the purpose. The machine has been in operation for some time, and accurate records of performance kept. Where it previously took four men eight hours to hand grind 100 ft of steel it now requires only three men to process 4,000 ft in the same length of time. Due to the adaptability of the milling attachment, it can be installed on any monorail in the plant in approximately one hour.



Figs. 1A and 1B above. Fig. 2, below, shows milling attachment attached to rail. Technique reported by *F. C. Clayton*, Chief Plant Engineer, Consolidated Vultee Aircraft Corporation.



The total cost of the milling attachment was approximately $500.00 and the indicated saving in labor and monorail tires is $6,300.00 per year. With a total rail footage of 105,650 of which an average of 50,000 ft can be cleaned and smoothed each year, the single machine is amply capable of serving the plant.

Case 22—Louisiana

Belt Conveyor Solves Cost Problem

A NUMBER of Southwest Louisiana rice mills, needing additional storage facilities for bulk rough rice, have satisfactorily provided it by converting existing (but idle) flat bottom bag storage space to this purpose. The major material handling problem was to efficiently reclaim from flat bottom bins of large floor area, because low headroom precluded the possibility of constructing hopper bottom bins.

The two important factors in these conversion jobs were: (1) efficiency in storing and reclaiming; (2) low overall cost per barrel of storage space. Cost was of major importance, as this operation is on the basis of "once in and out" per season. The solution was the utilization of certain necessary permanently installed conveyors, supplemented by light weight inexpensive portable belt conveyors.

The permanent installation is comprised of one bucket elevator, and two central screw conveyors running the entire depth of the warehouse. One screw conveyor is an overhead installation for bin filling, with the other installed beneath the floor for reclaiming. Light weight portable belt conveyors are used to take the rice from

the overhead screw conveyor for bin filling, and for reclaiming beneath the bins, and discharging into the screw conveyor beneath the floor. The use of four 20 in. portable belt conveyors for each operation eliminated the necessity, in one instance, of installing forty 9 in. screw conveyors each 85 ft long, and resulted in a substantial saving.

The Handy-Handler, a portable lightweight aluminum belt conveyor made by The Belt Corporation, was selected for the jobs. With its extreme light weight for portability, and large capacity for its size, flexibility in the system was achieved and cost was held to a reasonable figure.

The mills are in agreement that the following points were achieved:

1—Existing warehouse space that was idle, became active storage space.

2—An efficient system for bin filling and reclaiming.

3—Labor requirements are very low, resulting in low cost per barrel for handling.

4—Overall low cost per barrel of storage space for the conversion jobs—both as to cost of machinery and bin construction.

5—Extreme flexibility in the operation of the system.

Many industries with related problems could well investigate these material handling and storage jobs in detail. This basic system embodying portable and permanent conveying equipment, with specific modifications as demanded, could be the answer to many problems.—*Paul E. Taylor.*

Case 23—Louisiana Sugar Refinery

Conveyors Save 384 Dollars per Day

BECAUSE of rapidly rising costs Supreme Sugar Refinery, Supreme, Louisiana, found it necessary to change from the hand-truck way of warehousing and shipping to a more efficient method. After considerable study and checking on the various types of material handling equipment they concluded that Rapids-Standard Company gravity conveyors and power boosters would best answer their purpose.

Equipment Installed:

1. Two tandem horizontal belt conveyors (110 and 101 ft long) extending from a packing room conveyor throughout several connected warehouses.
2. Approximately 450 ft of Rapid-Wheel gravity conveyor and curves.
3. Several 10 and 15 ft movable Rapid Power Booster belt conveyors.

How System Works:

Bags and bales of sugar discharge from a packing room conveyor to the horizontal belt unit which extends the entire length of the warehouse and is elevated about 13 ft from the floor. Right-angle take-off stations on both sides of this conveyor are attached to gravity lines that lead in one direction to the rail siding and in the opposite direction across the warehouse to a truck dock.

Bags shipped by rail are transferred from the main belt unit to a gravity line which takes the packages through a wall opening out to the nearby siding. Three cars placed side by side are loaded without respotting by running the gravity line through the center door of the cars and loading the outside first, and the others in turn.

To load outgoing trucks, packages are removed from the main belt unit and placed on a gravity line extending across the warehouse to a loading dock. Sugar to be stored for later shipment is diverted to spur conveyor lines, and stacked with a portable belt conveyor.

Results:

1. Sixteen men on each of three 8-hour shifts are released from handling crew to do more productive jobs, at a wage saving of $384.00 per day.
2. Bag breakage and damage is reduced 75 per cent.
3. Delivery service is improved.

Loaded charging bucket, weighing 9620 lb, on its way to the cupola on an *Elwell-Parker* platform truck

Case 24—Alabama Foundry

Platform Trucks Handle Hot Load

THE main handling job in an Alabama foundry, and the toughest one, is transporting charging buckets. Loaded, they weigh 9620 lb each. Buckets are carried on skids by trucks between make-up points and foundry cupolas. Empties are returned for reloading. Runs are about 100 feet. Trucks are also used for such other jobs as carrying cast pipe from foundry to cleaning room, and scrap from cleaning room for remelting.

Two Elwell-Parker platform trucks of 10,000 lb capacity were first acquired. They are on the go continuously from morning 'til night. User reports no trouble with trucks, just normal wear as would be expected on such heavy-duty service.

On these operations each truck has released five laborers for more productive work. Previously, raw materials were manually loaded and pushed on hand trucks along narrow gage tracks. This slow, cumbersome method often caused expensive delays. Now, speed and flexibility of Elwell-Parker trucks keep movement of materials on schedule at all times. Trucks perform with ease and safety, operations that were constantly hazardous when attempted by workmen.

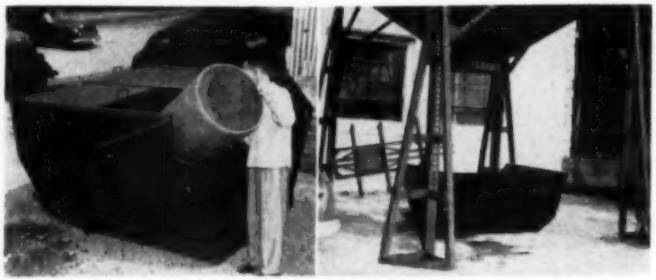
Case 25—Louisiana

System Outmodes Shovels and Ash Cans

THIS large Louisiana paper mill is saving thousands of man hours every month with the use of four Load Lugger-equipped trucks and 83 detachable Brooks bodies. Equipment is the product of the Brooks Equipment & Manufacturing Co.

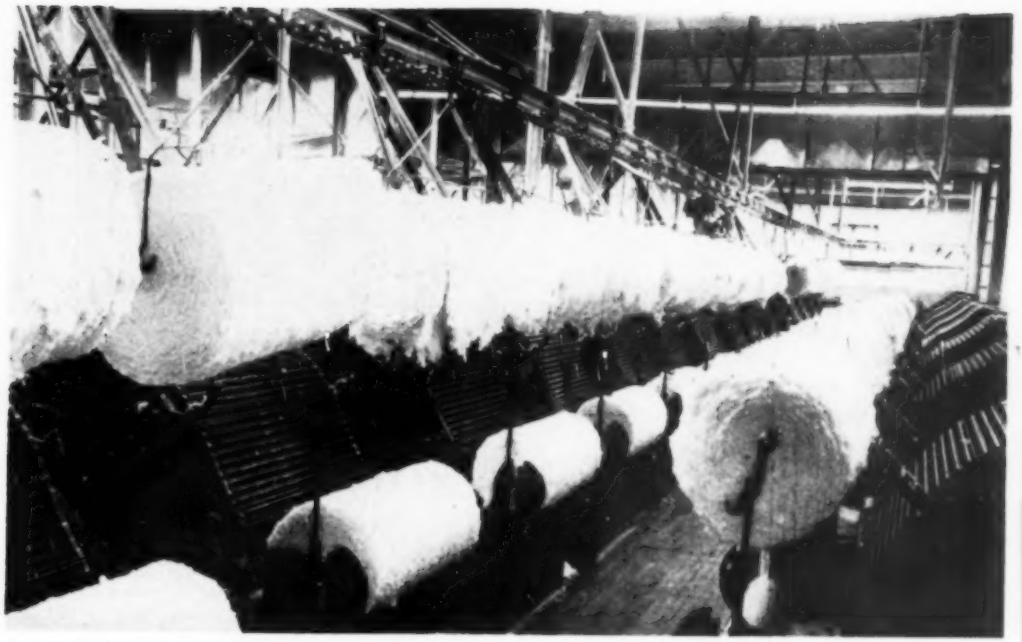
Materials handling is divided roughly into two types—disposal of wastes and residues, and haulage required on special jobs. The system is so flexible that there is no set number of bodies assigned to each task. Due to changing conditions one job may require twenty or thirty bodies; the next one only five or six.

For example, in relining their lime kilns Brooks bodies are used to bring new bricks and cement to the job and to carry away the burned-out lining. This job may be done only two or three times a year, but no special equipment is needed nor is it necessary to hire extra crews for loading, hauling and unloading. On the next job, these same bodies may be placed under the conveyor from the barking drums. Ordinarily, this material is burned in the boilers, but it has to be collected and hauled away when the boiler is shut down.



Enclosed garbage type bodies are spotted at plant entrances and at other locations throughout the yards for accumulation of waste paper and trash. Note bin discharge loading method at the right. These bodies are picked up and dumped four or five times daily. As each load is hauled away, an empty body is left behind.

Unnecessary re-handling is done away with because the bodies are loaded as and when materials accumulate. The shovel gangs that would normally ride the dump trucks all day are replaced by a lone driver and helper. When bodies are left under chutes, etc., to catch intermittent lots of waste materials, the job of loading is completely eliminated. Each Load Lugger does the work of four to six dump trucks and several crews.



Card operators lift the laps off the conveyor hooks and place them on the card storage racks. The cards at extreme right show laps in position on such racks. When the lap being fed into the card runs out, the lap in storage replaces it, and another lap from the conveyor is placed on the storage rack. Since the Webb trolley conveyor runs continuously, laps not removed from it continue on their way and return after a full circuit.

Case 26—South Carolina Textile Mill

Overhead System Both Transports and Stores

MANY large textile mills have found the overhead trolley an ideal materials handling method of conveying laps from picker room to carding department. A cotton lap, as it comes from the opening machinery, is a large roll of batting weighing about 50 pounds. Until recently, these laps were conveyed to the next step in the process on hand trucks which held six or eight laps each. These trucks are heavy, hard to handle, and take up a lot of space, especially when a large number of them collect in the card room waiting to be unloaded from the trucks and placed on cards. The overhead conveyor system eliminates these disadvantages and provides an efficient, economical, and reliable mechanical handling system combined with automatic storage.

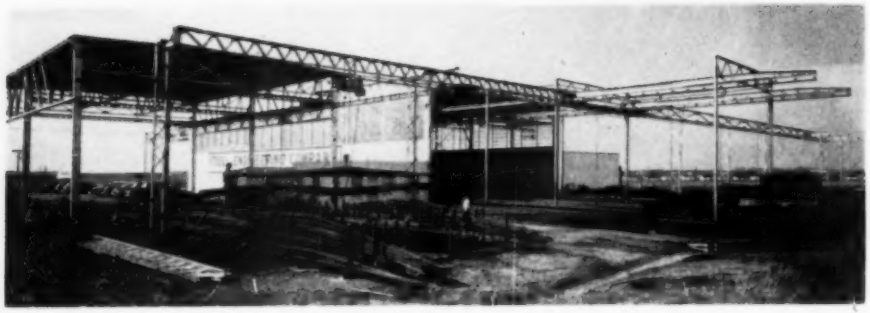
The Webb Trolley Conveyor in the Toxaway Plant of Textron Southern, Inc., Anderson, S. C., is a typical example of such an installation. About 18 months ago the opening room was moved to a separate building across the street from the card room. This move made some new lap handling system imperative, for it was not practical to transport laps by truck across the street from one building to the other.

Jervis B. Webb Company installed the overhead conveyor. It consists of a continuous rail, which runs overhead from the pickers in the opening room, across the street, into the card room, then back again to the opening room. A chain, supported from the rail by rolling hangers is driven continuously at the rate of a few feet per second. At five foot intervals, steel wire hooks are attached to the chain, the hooks being shaped so that they will support a lap by the rod which runs down its center.

Operating Data

In the opening room, laps are lifted from the pickers as they are completed, are weighed on pan scales, and are then placed on conveyor hooks as they move by. When the laps reach the card room across the street, they are removed from the conveyor as needed to load cards. Any laps not removed continue on their journey and go back through the opening room and make another circuit. It can be seen that this system acts not only as a conveyor but as storage for laps in excess of those required to feed the cards.

Mr. W. M. Carlisle, Division Manager, Textron Southern, Inc., says that this is a very reliable system which has given good service with practically no maintenance during the 18 months it has been in use.



Case 27—Texas Structural Shop

Tramrail Bridges and Carriers

THE Steel Engineering Co., Ft. Worth, Texas, is headed and manned by young aggressive men who know the importance of materials handling equipment as a means for speeding production and lowering costs. Within three years this company was able to cut the man-hours required for various jobs by an average of 40% because of the installation of Cleveland Tramrail overhead handling equipment. Thus, without expanding the plant structure, or adding to fabricating machinery or working force at that time, production was stepped up by 66%.

Being situated in a part of Texas where winters are never severe, much of Steel Engineering's operations are carried on out-of-doors. Tramrail bridges and carriers serve both inside the plant and outside, and travel on structures erected specifically for their operation. This makes possible delivery of materials from various parts of the yard to any part of the shop without rehandling. Originally the equipment was hand propelled, but now it is motor propelled and this, too, has proven of importance in lowering costs.

Steel Engineering has grown rapidly and now is several times larger than originally. It also has established another sizeable plant at Corpus Christi that also is equipped with Cleveland Tramrail. It is interesting to observe that although this company is an important fabricator of trusses and various steel work for buildings, it recognizes the importance of installing materials handling equipment especially built for the purpose.

Case 28—Tennessee Metalworking

Fork Trucks Help Coordinate Material Flow

Fork truck hauls components to the paint department. Overhead conveyor in background removes items through paint-dipping to shipping department.

ALTHOUGH our plant layout requires three lines of material flow to the assembly area — which not only originate at opposite ends of the plant but from two floor levels — our handling system provides smooth material flow at low operating cost.

The material we use in the manufacture of tractor-drawn discs, plows and tillers falls into three main categories: castings produced by the foundry; components fabricated from incoming raw material; and completely manufactured items received from suppliers. Separate production lines with their own handling systems serve the foundry and the fabricating departments. These two departments are closely coordinated to assure a balanced flow of finished material to the centrally located assembly area.

Fork trucks move the material from the two production departments to this assembly area. The third line of material delivery is

from finished parts storage to assembly.

Sheet steel and bar stock move from railroad cars into storage area by means of a crane which travels over the railroad siding. The same overhead crane system is used to move the material from storage to such production machines as the shears, saws and punch presses. Throughout the rest of the production or machining department the material is moved in tote boxes or on skids by fork truck.

The foundry is located on the opposite side of the assembly department. Here, a fork truck moves the castings from the shake-outs to the cleaning department and then to the machining and sub-assembly departments. This truck also delivers material from the basement storage area to sub-assembly and main assembly departments. A paved 12 degree ramp, 76 feet long, provides access to the basement storage area for the truck.

Located immediately adjacent to the assembly line is a storage area from which the line draws the individual units of materials as they are required. Assembled units are moved by an overhead conveyor to the paint dip tank, and subsequently to the shipping department. From here the units are taken into boxcars by a 2000 pound capacity three-wheel gasoline powered fork truck.

The economical results obtained by Athens Plow with its fork trucks in coordinating material flow can be attributed to the recognition of two important factors in fork truck applications: Ability to meet anticipated duty cycles and ability to work under adverse operating conditions.—*E. Roy Nonkivell, Jr., Pl. Eng., Athens Plow Co.*

Courtesy The Baker-Raulang Company

Case 29—South Carolina Textile

Silk from Sand at Fiberglas Plant

IN addition to natural and organic synthetic fibers, the South now produces one of the newest of yarns, Fiberglas. Made largely from selected silica sand, the basic ingredient of glass, this velvety white yarn with the look and feel of silk but the durability of glass has, for the past year, been manufactured at the Anderson, S. C., plant of the Owens-Corning Fiberglas Corporation. This plant makes Fiberglas yarns for use in electrical insulation; curtain and drapery fabrics; reinforcements for plastics, paper, tape, hose, and conveyor belts; and other consumer and industrial products.

Newest of the Corporation's three plants, Anderson is the first to make Fiberglas by a direct-melt process. Two other plants — at Ashton, R. I., opened in 1941, and Huntington, Pa., completed in 1943 — make Fiberglas "marbles" as an intermediate step, then re-melt the marbles. But at Anderson the hot, viscous product of the melting furnaces is drawn directly into Fiberglas filaments.

Besides silica sand, the materials going into Fiberglas include clay, limestone, boric acid, fluorspar, and salt cake. These ingredients are mixed according to formula in power mixers and poured into man-high "batch cans." An overhead crane carries the batch can to the feeder, a stoker-like device on each furnace which feeds in the batch.

From the furnace, which operates at 2800 F, molten glass flows through a purifying unit and, at a speed of two miles a minute, out of precious-metal bushing with 204 tiny holes. A coating of binder unites these 204 ultra-fine filaments into a single continuous strand of Fiberglas, which may be wound or twisted and plied into yarn, then packed for shipping.

Scrap from these operations is dropped through holes in the first floor to vats in the basement. Every day the vats are emptied into push trucks which are taken on the self-leveling Otis freight elevator up to the main floor so that the scrap can be hauled away.

The elevator operates automatically by push buttons, the control mechanism assuring each load of a non-stop trip to its floor. Serving the basement, main floor, and mezzanine, the elevator travels at 40 feet per minute and has a capacity of 15,000 pounds.

It also carries pallet loads of Fiberglas "marbles," which are being used on an experimental basis at the present time, up to the furnace level. A lift truck places the pallet on the elevator. When it reaches the furnace level, another truck picks up the pallet and takes it to the feeder.

Power truck placing pallet loads of *Fiberglas* "marbles" on *Otis* freight elevator in new Anderson, S. C., plant.

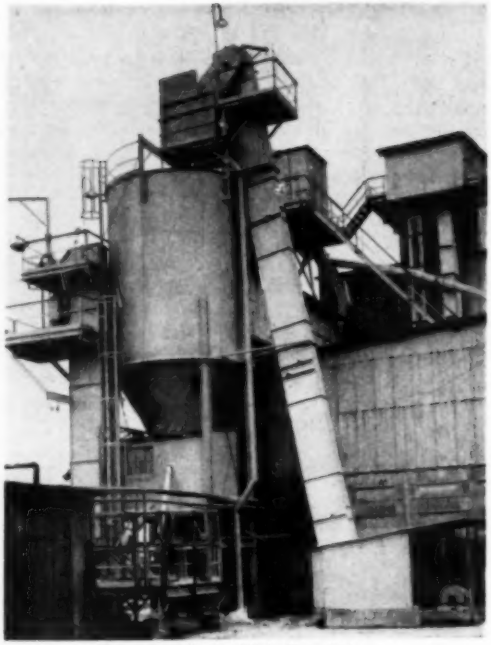
Case 30—Louisiana

Elevator Cuts Maintenance

A Beaumont Birch "Multi-Vator" —a single strand, duplex bucket, perfect discharge elevator, rated at a nominal capacity of 3 tons per hour, is handling calcined fluoride chemical at an actual capacity of 4 tons per hour 24 hours per day, 7 days per week. The calcined fluoride weighs 80 lb per cu ft and is handled at temperatures with a range of 300 to 400 F. The elevator contains 6 in. x 6 in. duplex buckets on 66 foot pulley centers, and the chain travels at a rate of 60 feet per minute. Whereas a vertical unit was used before, the "Multi-Vator" is operated at an incline 2⅛ in. in 12 in. from the vertical. This incline eliminated the need for a horizontal conveyor at either the top or bottom of the installation.

After 9,500 service hours, accrued over a fourteen month period, actual cost of maintenance averaged $25.00 per month. This unit has saved the company $3,850.00 the first 14 months.

The Assistant Chief Engineer, of this southern chemical company, who is particularly familiar with the operation of the "Multi-Vator," says: "We consider this installation to be well engineered and are very well satisfied with the operation of the elevator, both from a capacity and a maintenance standpoint. For this reason, we expect to continue to receive satisfactory service from this unit for years to come."



Beaumont Birch "Multi-Vator" in a Southern Chemical plant.

Case 31—Tennessee

Roller Conveyor

THIS book printing plant used platforms, and bundles of printed sheets were hauled on trucks to the storage room and then sent out by hand trucks as jobs were called for in other departments. Such operations consumed excessive time and required considerable labor.

The company now reports that a $9,550 Logan Company roller conveyor installation has paid for itself in less than one year. Now when the printed sheets come into the storage room on a 190 ft Logan roller conveyor, they are placed in storage until orders are called in to be sent out on another 600 ft conveying unit. Company engineers report savings in effort, time and space,

Case 32—Arkansas

Conveyor Belt Cuts Coal Handling Cost

A 3620 ft conveyor belt manufactured by Quaker Rubber Corporation, Division H. K. Porter Company, Inc., Philadelphia, is speeding production and reducing costs in one of Arkansas' mechanized mines — the Quality-Excelsior Coal Company mine in Greenwood, Arkansas.

The conveyor belt installation speeds operations by bringing out coal from the mine to the tipple at speed of 350 fpm. Some 1,550 ft below the surface, the coal is cut by machine and then loaded onto the moving conveyor belt. The belt brings the coal up the slope to the surface and then up to the tipple. From the tipple it falls into shakers where it is sized and screened before being distributed into waiting railroad cars through loading chutes.

Coal moving on a 3620 ft conveyor belt at a speed of 350 fpm at the Quality-Excelsior Coal Company mine in Greenwood, Arkansas. The Belt was manufactured especially for Quality-Excelsior by *Quaker Rubber Corporation, Division H. K. Porter, Inc.*, Philadelphia.

Case 33—North Carolina Lumber Mill

Better Handling Cuts Labor and Saves Space

THE procedures at Statesville Manufacturing Company, Statesville, North Carolina, needed to be improved because handling costs were steadily on the rise and labor had to be reduced while production was increased. Planning numerous changes on the basis of using a new Hyster 150 fork lift truck, production equipment and storage yard were rearranged to take advantage of full savings offered by mechanical handling. The renovation of the yard has resulted in many improvements. Yard labor was reduced by four men while the amount of lumber handled was multiplied by three.

A detailed description of these improvements, adequately illustrated, is scheduled for an early issue of Southern Power & Industry. *Mr. William L. Allison, Jr.*, who played an important part in designing and activating the improvements, will be the author.

Case 34—Louisiana Bakery

Material Handling in Bakery Operation

IN modern bakeries, such as Holsum Bakeries Inc., New Orleans, Louisiana, the use of mechanical devices for handling supplies and materials plays a very important part in the efficient and economical operation of the plant.

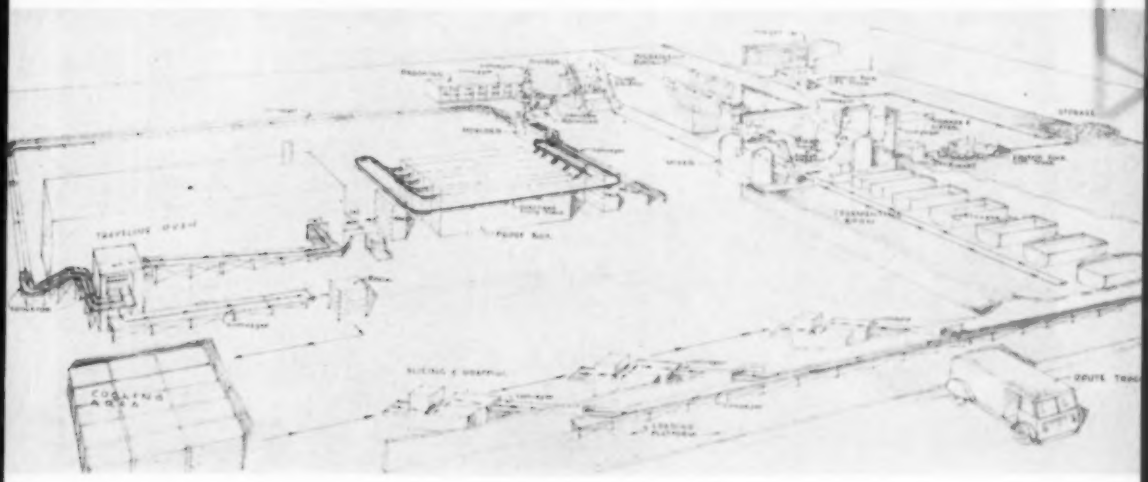
Supplies are received in car load lots and transferred by means of a Yale electric fork lift truck to storage areas. As these supplies are needed they are again moved by fork lift truck to the desired area. Flour is conveyed by bucket and screw type conveyor to sifter and storage bin. By means of screw type conveyor the sifted flour is moved to hopper, weighed and then dumped into automatic mixer. After mixing, the dough is dumped into long metal troughs on rollers, then rolled into fermentation room. From fermentation room, the dough troughs are rolled to screw type elevator where the troughs are raised and dumped into second mixer where other ingredients are added (salt, sugar, shortening, milk, etc.).

After the second mixing, the dough is again dumped into long metal troughs on rollers and moved to screw type elevator where the trough is raised and dumped into hopper of the divider machine. The dough is divided into correct size for loaf of bread and then conveyed by belt conveyor from divider to rounder and then by bucket conveyor through long overhead proofer.

The proofer conveyor dumps the dough in the moulding machine for moulding and it is then automatically placed in baking pans. Here the pans are manually handled and transferred to large racks. These racks are moved by overhead trolleys into the large proof box. After a given period, these racks are again moved by the trolley to the loading end of the traveling oven. The pans are manually removed and placed on oven conveyors which travel through oven and then dump finished products in receiving bin.

The empty pans are carried by conveyor back to moulding machine for reuse, and the baked bread is stacked on racks and then rolled to automatic slicing and wrapping machine. From these machines the completed loaf is carried by conveyor to the packaging department.

By the use of such mechanical material handling equipment — Holsum has been able to offset rising cost and still improve the quality of the product.—*O. V. Baldwin.*



Section 6

Power and Steam Supply

Steam demand exceeded boiler capacity . . "kw producing reducing valve" . . scale and foaming difficulties . . diesel converted to dual fuel . . boiler load shock minimized . . deionizing . . fly ash arrester eliminates nuisance—increases efficiency . . demineralizing makeup water

Case 35—North Carolina Chemical Plant

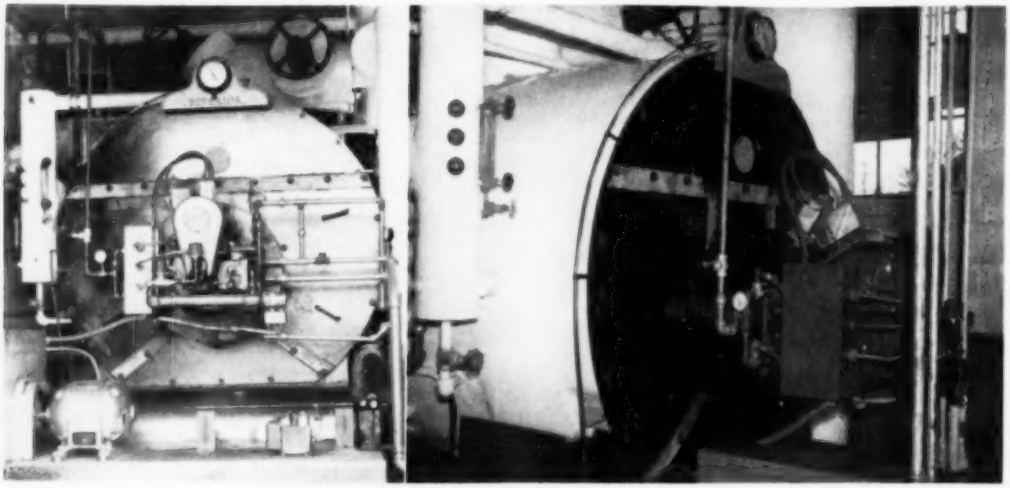
Automatic Boiler Saves Fuel and Labor

MINIMUM attendance and high economy are features that led a North Carolina textile chemical manufacturer to select a 150 hp, 125 psi, completely assembled, automatically controlled, oil burning boiler to supply steam for processing and building heating.

The unit supplied by Superior Combustion Industries, Inc., operates 8 hours per day for processing, and 24 hours per day in winter for heating. It burns No. 5 oil or lighter without preheating, and develops maximum rating at better than 80 per cent efficiency.

Being fully automatic, no regular operator is required. The plant engineer checks the boiler and controls regularly, and brings it in and out of service as required. The starting and stopping procedure is accomplished by throwing only one switch.

Installational views of the automatic steam generator supplied by *Superior Combustion Industries, Inc.*



Case 36—Virginia Tobacco Plant

Greater Capacity—Better Steam Control

Instead of adding a boiler, two boilers are now doing the work that three couldn't handle—the third is standby.

WHEN the demand for steam exceeded our boiler plant capacity, one of two alternatives was necessary. Either a new boiler had to be added, or the three already in service had to be reconditioned to increase their steam generating capacity. In addition to the increased demand for steam, our manufacturing plant called for better process load regulation.

The problem, then, was one involving (1) increase of capacity, and (2) better regulation of the process steam. It was clear that the addition of another boiler, aside from the considerable capital expenditure it would involve, was not the complete answer.

The decision was made to recondition our existing boilers and to install the Hays Combustion Control System. The Hays instruments and controls, through greater efficiency made possible by accurately controlled combustion, combined with the other changes we made in the boilers themselves, gave us the solution to the first part of our problem, that of increasing steam capacity.

Boiler Changes

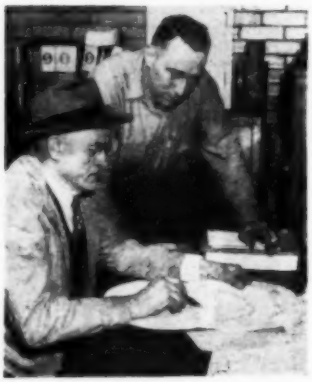
There were several steps in the reconditioning of the three Edgemore bent-tube boilers in the plant. The refractory fire brick was removed, increasing the grate area in each unit from 95 to 106 sq ft. Water walls were added side, front, and rear, and the Taylor multiple retort stoker serving each boiler was enlarged from 4 retorts to 5 retorts.

The boilers, rated at 550 hp, are now operating at 250 per cent of rating. Only two of the three reconditioned boilers are presently in use, since they adequately handle the load which varies from 40,000 to 50,000 lb per hr per boiler. The third boiler serves as a standby.

Steam enters the G. E. non-condensing type turbines — two 1250 kva and one 500 kva—at 450 psi and is exhausted to the factory at 90 psi as process steam. Steam is superheated to 600 F by a 2-drum superheater. After passing through the turbines, 50 F superheat remains in the exhaust at 90 psi. A spray-type desuperheater is used to bring the remaining superheat back to saturated steam.

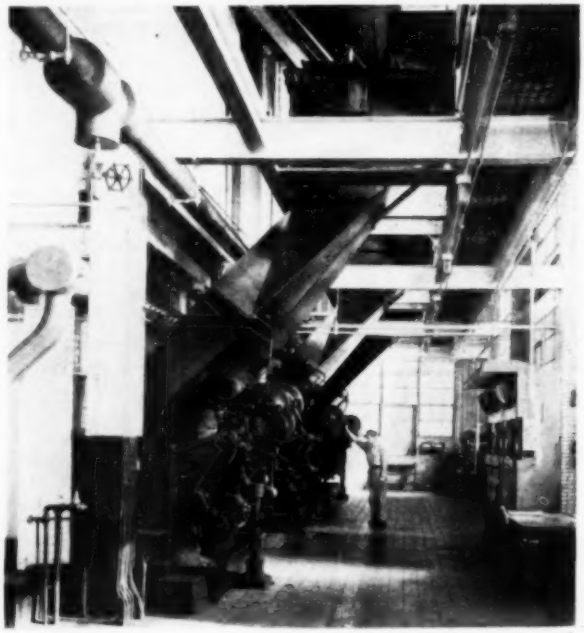
Control System

The Hays instruments and controls also gave us a very satisfactory answer to the second part of our problem, that of regulating the steam that goes into process, by giving us accurate, automatic control of the load. As the demand fluctuates (and it sometimes varies as much as 20,000 lb per hr), the master controller on the main control panel follows it automatically and maintains balanced combustion. Control is accomplished, as shown in the various illustrations on these pages, by (1) controlling the damper on the induced draft



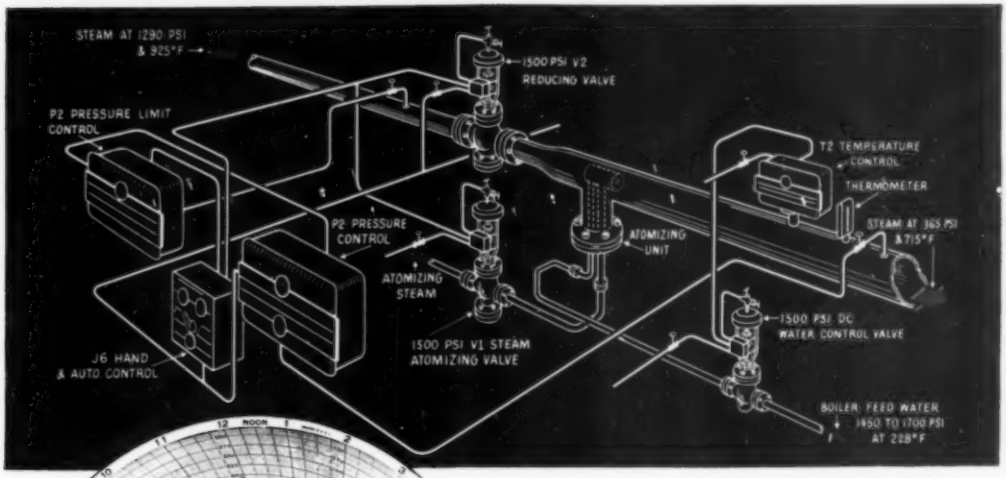
T. Y. Lovern, Chief Operating Engineer, and his maintenance man anticipate problems by analyzing their instrument charts.

These boilers supply power and process steam to the factory that produces Lucky Strike cigarettes. The drying and other processes which go into the making of cigarettes require particularly close regulation of the steam load used in manufacturing.



This material has been adapted from an article authored by *T. Y. Lovern*, Chief Operating Engineer, Virginia Branch, American Tobacco Co., Richmond, Virginia and published in a recent bulletin of the *Hays Corporation*.

Swartwout RDC* controls within ±1 psi and ±3°F even with widely fluctuating load swings



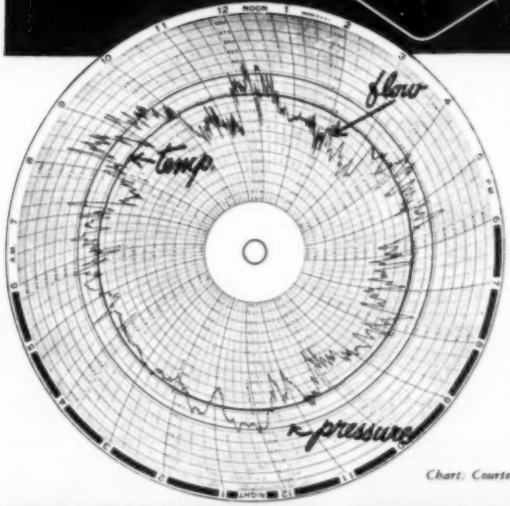
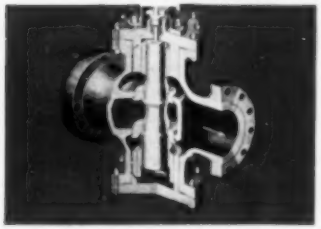


Chart: Courtesy Iowa Power and Light Company

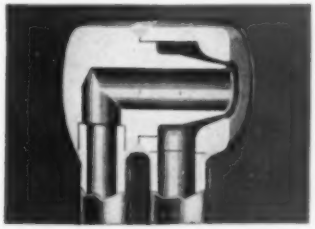
1 Chart shows how Swartwout RDC*—Reducing, Desuperheating and Control System—handles low-pressure turbine load of 65,000 to 165,000 lbs. steam per hour in Des Moines Power Station No. 2 of the Iowa Power and Light Company. It reduces from 1290 to 365 psi and desuperheats from 925° to 715°F. When main reducing valve closes, extremely light loads can be handled by pressure reducing valve supplying atomizing steam. Operation of the system is stable regardless of load change or time lag. Because of the exceptional control obtained by this large station, the Iowa Power and Light Company later purchased an additional small Swartwout RDC unit to supply steam to house turbines.

Swartwout

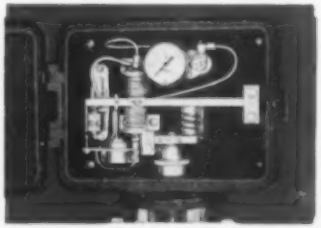
POWER PLANT EQUIPMENT



2 Swartwout V-2 Regulating Valve has smooth, nozzle-shaped passages which guide expansion of high-pressure steam to reduced pressure zone without high-velocity impingement or other destructive forces common to conventional valves. Undue noise, turbulence and vibration are eliminated; longer valve life results.



3 Swartwout Steam Atomizing Desuperheater, constructed of stainless steel, has accurately machined passages that give narrow-angle dispersion of cooling water outside of steam atomizing head. There is no impingement of steam or water against walls of unit, no erosion of parts, no need for pipe liners.



4 Swartwout T-2 Control, with metallic temperature element in steam pipe, gives rapid and precise control regardless of magnitude of load or time lag. There are no flapper valves, relays or other delicate elements. Only two simple adjustments are involved; one for temperature, one for response.

A-5092

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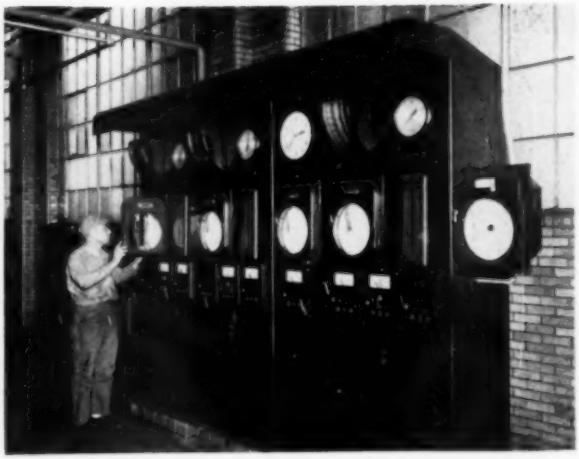
fan to obtain the correct furnace draft, (2) positioning the inlet damper of the forced draft fan to proportion the flow of air to the amount of fuel, and (3) regulating the speed of the stoker to obtain the proper amount of fuel. Hays power units at these various stations operate directly with the master controller on the main instrument panel.

Coal is handled by dumping cars onto an underground conveyor that carries it to the elevator, and then overhead where it can be diverted three ways: (1) into the 450 ton overhead bunker feeding directly to the stokers, (2) into the silo, or (3) on the stock pile. The coal is 1¼" nut and slack of 14,000 btu value. A Hays tachometer blower operates with the power unit and the main panel in regulating the speed of the stokers, determining in this way the rate of coal feed.

In our manufacturing process about 50 per cent of make-up water is lost. Total feedwater is between 65,000 and 70,000 lb per hr, the source of raw water being city water through zeolite softeners.

Although we had not originally planned it as a part of the reconditioning project, we find that due to the properly controlled combustion, our maintenance on both stokers and boilers has been considerably decreased.



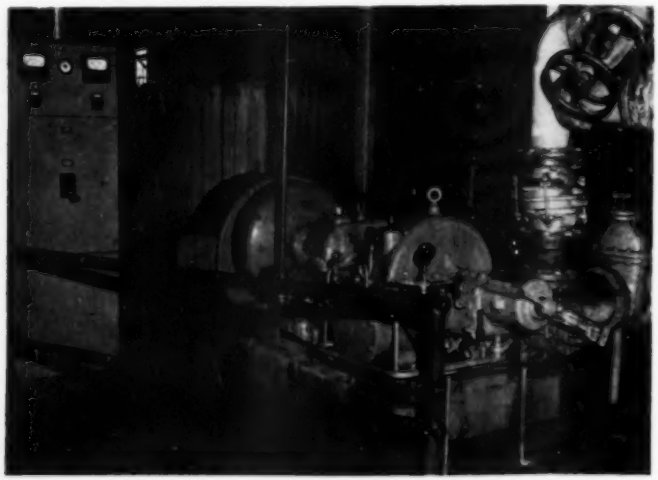
Instrument panel of the Hays automatic combustion control system.

Case 37—Florida Food Products

Steam Turbine Driven Induction Generator

A TURBINE driven induction generator operating in the Auburndale, Florida, plant of Clinton Foods, Inc., is a good example of specialized generating equipment, correctly applied.

The induction generator is basically an induction motor operated as a generator. Since it draws its excitation as wattless current from the power system, it has no value for stand-by purposes. But when it delivers to an established power circuit and can be driven by a turbine that supplies exhaust steam for processing, the advantages are many. Where this type of turbine-generator fits into industrial plant requirements, its capital cost is very low compared with other methods, and it does not require skilled operators.



The Clinton Foods mill at Auburndale produces among other things two important by-products of the citrus industry, molasses and cattle feed. After the fruit has been put through the juicers, the peel is ground and then pressed in dewatering presses. The press liquor is then evaporated in a quadruple effect evaporator. This evaporator requires low pressure steam in fairly large quantities in the first effect. In this particular installation pressure in the first effect ranges from below atmosphere to approximately 4½ lb gauge.

Clinton engineers decided to purchase a Worthington turbine to exhaust directly into the evaporators and drive a 250 kw Electric Machinery Manufacturing Company induction generator. The turbine

too few cooks spoil the production

What did all these plants have in common? They had switched from old-style steam traps to Yarway Impulse Steam Traps.

Yarway Impulse Traps are designed for more production . . . *to get equipment hotter, sooner and keep it hot.* Additional features include small size, easy installation, low maintenance, low cost, stainless steel construction . . . and Yarway service available from nearby Yarway steam trap engineers.

You can buy Yarways from the nearest of over 200 Industrial Distributors. Over 800,000 Yarway Impulse Traps already have been installed. Write for Bulletin T-1740.

YARNALL-WARING COMPANY
Home Office: 116 Mermaid Ave., Philadelphia 18, Pa.

Southern Representative:
ROGER A. MARTIN, Bona Allen Building, Atlanta 3, Ga.

You can try a Yarway trap for free in your own plant for 60 days. Prove its advantages under your own conditions. Drop us a card.

YARWAY

the steam trap designed with more production in mind

selected is required to operate non-condensing up to 4½ pound gauge back pressure and also to operate condensing. In actual service the unit operates most of the time with a back pressure below atmosphere. It was decided, in order to take advantage of better performance at higher speed, to use a single stage turbine connected to the generator through a Worthington reduction gear. The turbine is provided with a thrust bearing suitable for condensing operation, and is fitted with the maximum number of hand valves to take advantage of the various groupings of nozzles between non-condensing and condensing operation and provide maximum part load efficiency. This particular unit has performed so well, however, that it has been operated at full load most of the time.

A Fisher air operated pressure control was selected because of the necessity of maintaining very close regulation of the back pressure at pressures above atmosphere as well as pressures below atmosphere. The electrical controls and board were furnished by Electric Machinery Manufacturing Company. The entire control system has been completely satisfactory.

Advantages contributing to low capital cost and ease of operation are:

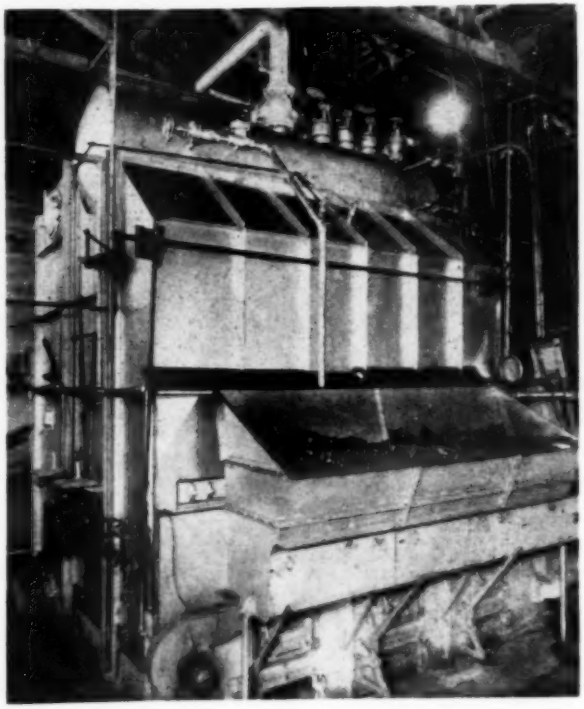
1. No expensive switchgear is necessary. Adequate protective devices and a switch for putting the generator across-the-line with the paralleled source are all that are required.
2. Very little space is required to install complete equipment and no expensive foundations of any kind are necessary. A concrete slab is quite adequate.
3. No trained personnel are as a rule required to operate the equipment, because paralleling consists of merely closing a switch and anyone in the plant can become familiar with this operation very quickly. The unit is brought up to about 1 or 2% above synchronous speed, and then the operator merely closes the switch and the machine is placed under control of the back pressure governor.

It should be mentioned that one characteristic of induction generators is that they contribute to lagging power factor. This condition is corrected at the Auburndale plant by the addition of capacitors which are quite inexpensive and readily available.

The unit takes the place of a pressure reducing station, and generates electric power in proportion to the steam requirement of the evaporator. It is truly a **kw producing reducing valve** and pays for itself very rapidly. In fact this particular installation returned the capital invested in the first season of operation.

Units of this type are available mounted complete on a welded base plate for easy installation.

W. H. Mouquin
Steam Turbine Division
Worthington Corporation



Case 38—Georgia Bleachery

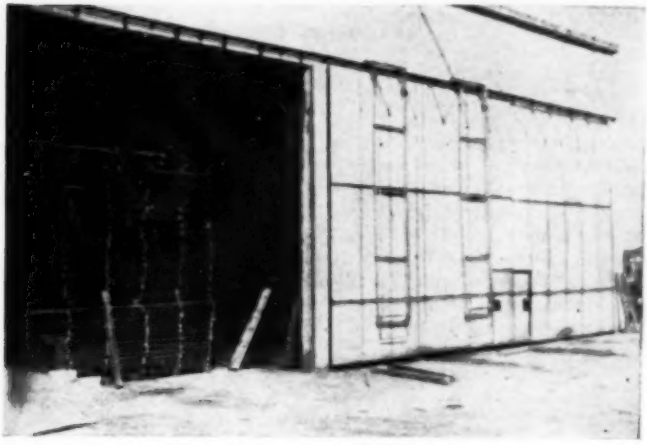
Multi-Burner Spreader Stoker

THE Yates Bleachery Company plant at Flintstone, Georgia, was originally equipped with three, 200 hp water tube boilers arranged for hand firing. Due to increased production and higher steam load, furnace volume was increased by lowering firing floor and installing three *Fyr-Feeders*, manufactured by the American Coal Burner Company of Chicago.

In 1949 it was necessary to carry a lower operating pressure on one of the boilers. In view of plant production, management decided to remove this boiler and replace it with a large steam generator to carry the load and use the two remaining boilers for stand-by service. A high capacity *Fyr-Feeder* Air-Spray-Spred Multi-Burner Spreader Stoker with dumping grates and automatic combustion controls was selected to serve the 45,000 lb/hr steam generator. Unit provides flexible operation which responds to sudden load changes common in plant operations of this kind.

"Best" New Dry Kilns Work Better with Armstrong Unit Trapping

4 Traps Increase Capacity 8%



▲ One Armstrong No. 215 inverted bucket steam trap is used on each of the four dry kiln coils at Wells-Oates Lumber Co., New Bern, N. C.

◀ The time cycle on this lumber dry kiln was reduced from 72 to 66 hours by Armstrong Unit Trapping.

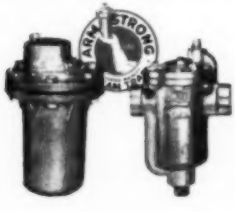
OFTEN a large capital investment in steam heated equipment is not utilized fully simply through failure to drain condensate and air efficiently. Here is a typical case:

Wells-Oates Lumber Co., New Bern, N. C., recently made one of the finest and most modern dry kiln installations possible. And it worked fine. But, it works better now, thanks to the installation of an individual Armstrong steam trap on each of the four steam coils in the kiln. The kiln cycle time has been reduced from 72 hours to 66 hours. The capacity has thereby been increased over 8% by an investment in traps of only a little over $200.

The trap installation was made upon the recommendation of DeWitt H. Skinner of Allan T. Shepherd Co., the local Armstrong Representative. The reason behind his recommendation made sense to the Wells-Oates people —*"with one trap on each of the four coils of the kiln, all coils would be properly purged of condensate and air and it would, therefore be impossible for one coil to influence the operation of another coil." The results proved the point.*

Your local Armstrong Representative may be able to show you how to get more out of your steam heated equipment. Remember, he sells a product that is *guaranted to satisfy. Call him or write:*

You always get more out of equipment when you use Armstrong "Unit Trapping"



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a Catalog and Educational Handbook on Condensate Drainage

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Please send me a Steam Trap Book.

Name .....

Title .....

Case 39—North Carolina

An Aid in Coal Stocking

BRIEF mention was made of the Swiveloader in our description of the new steam plant of Kerr Bleaching and Finishing Works (Southern Power and Industry, Dec., 1950). Now that the coal handling equipment has seen extensive service, a more complete report can be presented on the "Swiveloader" manufactured by Stephens-Adamson Manufacturing Company.

The internal arrangement of the coal silo is such that coal is first delivered to a storage shelf near the top, and then spilled over into the 200-ton dead storage portion of the silo. When the silo is filled to capacity, additional coal falls through an overflow chute and is stacked on the storage yard by the Swiveloader. A hopper in the bottom of the silo and two hoppers opening into the outside conveyor permit selective return of dead storage coal from the silo or storage yard to the shelf.

The Swiveloader permits stacking coal in a semi-circular pile about 60 ft radius, centered on the silo. Its operation does not require any additional men because the regular shift helper can unload coal as part of his normal duties, and he can also send it to the stockpile through the Swiveloader as easily and conveniently as he can fill the silo. The loader easily handles coal at the rate of speed of the underground conveyor and elevator, which is 25 tons per hour.

The high-speed propelling action of the Swiveloader, in projecting coal some 60 ft onto the pile, naturally segregates the nut and slack coal — the fines collecting close to the loader and the size increasing to maximum at the outer fringes of the pile. It is advisable to rework the stock pile thoroughly with a bulldozer if the storage is to be held for a considerable period, to guard against spontaneous combustion. In such cases, the operators at Kerr build the stock pile gradually, spreading, mixing, and compacting in thin layers. They have done this chiefly in their long-time storage pile which is adjacent to but beyond the area reached by the loader. The pile built by the loader itself is normally used primarily as give-and-take to supplement silo capacity, and no special handling is necessary in this case.

The area covered by the loader within its natural range (which is accomplished by raising or lowering the discharge pulley) has been increased by use of a telescopic tube which permits about 10 ft of adjustment in the position of the entire unit. This system of handling has proven quite satisfactory.

Case 40—South Carolina Lumber Mill

Feedwater Treatment for Lumber Mill Boilers

A SOUTH CAROLINA lumber mill was feeding raw well water to its boilers. They experienced great difficulty with scale and foaming. Many different boiler compounds were tried which proved expensive and ineffective.

An Industrial Products Company representative visited this plant and obtained not only a sample of the raw well water used, but also full operating information on the boilers. Analysis of the water together with the boiler information formed the basis for recommendation of a feedwater treatment for the particular problem encountered.

In this case, the boilers required a combination of phosphate, alkali, and sludge conditioner together with an anti-foam to combat the high percentage of organic matter present in the raw feedwater.

A proper method of continuously feeding the treatment was recommended and a Manzel chemical feeder was installed on the boilers. Instructions were furnished the boiler operators whereby they could treat the boilers correctly without any extensive chemical knowledge.

The chemicals required to treat the boilers were furnished by Industrial Products Company, and the boiler water was analyzed at frequent intervals to determine progress being made inside the boilers.

After about sixty days, the boiler operations were improved, less fuel was used and a higher quality steam was produced. Feedwater treatment costs were reduced forty per cent while results were obtained in preventing scale. Close follow-up proved to be of benefit to the lumber company. Thereafter, difficulty was avoided before it had a chance to impair boiler operations.

Converting Diesel to Dual Fuel Cuts Costs in Texas Municipal Power Plant

IN 1941, three 450 hp Fairbanks Morse, 6-cylinder, crankcase scavenging diesel engines were installed in the new municipal power plant of Weatherford, Texas. The plant was soon expanded with the addition of a 1200 hp, 6-cylinder, pump-scavenging, Fairbanks-Morse diesel engine. Additional expansion necessitated the purchase of a 10-cylinder, Model 33F-16 diesel rated at 2000 hp at 300 rpm.

Then the cost of diesel fuel was 3.25 cents per gallon. Today, the same fuel costs 8.50 cents per gallon. With natural gas available at Weatherford for 20 cents per thousand cu ft, management decided to take advantage of the cheaper fuel by converting the largest engine in the plant to dual fuel operation. Conversion of the 200 hp unit was completed in May, 1951.

Operating Economies

The converted unit has produced a kilowatt-hour for a total fuel cost as low as 2.49 mills and is averaging 2.73 mills. Compared with diesel fuel cost of 6.49 mills, even the higher dual-fuel figure represents a saving of 3.76 mills per kwh, a cost reduction of 58 per cent.

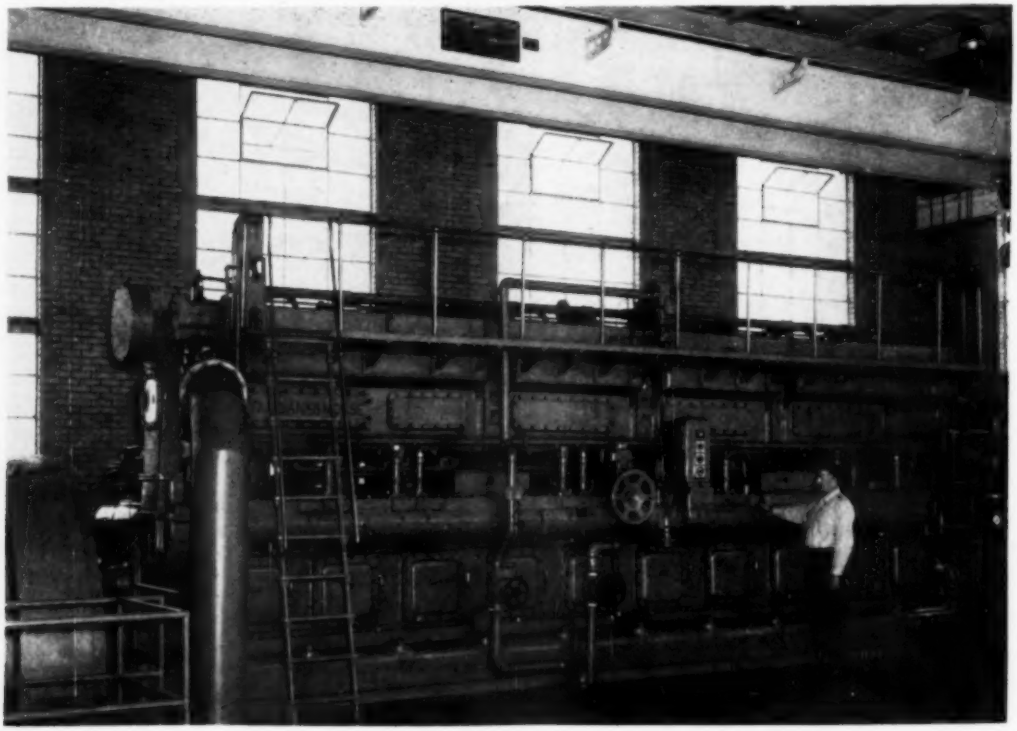
NOTE: A feature semi-technical description of "How Conversion to Dual Fuel Cut Weatherford, Texas, Power Costs" will be featured in the November issue of SP&I. Data will include costs, operating details, principal equipment tabulation for the 2000 hp engine, and plans for future plant expansion.

More Information Available

Many of these modern procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case histories in this 5th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N. E., Atlanta 5, Georgia. There is no obligation.

Chief Engineer, *T. A. Cooper*, inspects the new 2000 hp dual-fuel *Fairbanks-Morse* diesel. It was installed in 1947 and converted to dual-fuel in May of 1951. View shows *Woodward* governor and the *Madison-Kipp* cylinder lubricators.



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No other fittings for pipe welding are so true to their markings as WeldELLS — so absolutely uniform, mechanically, metallurgically, dimensionally.

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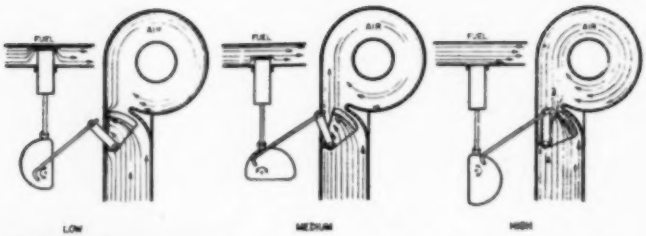
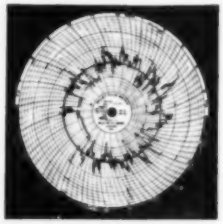
Case 42 —Georgia

Constant Pressure



The air supply damper linkage and the fuel valve cam are calibrated and adjusted during fire testing before shipment for uniform combustion efficiency at every point between 30% and 100% of rated load.



The chart shows steam demand and boiler pressure for two 300 horsepower gas-fired Orr & Sembower Powermaster automatic steam generators in a southern textile dyeing operation indicates uniform pressure between 20% rating and 10% rating.

THROUGH a pressure controlled potentiometer, the damper motor of the Orr & Sembower Powermaster package unit boiler simultaneously positions the fuel valve and air damper for uniform combustion efficiency.

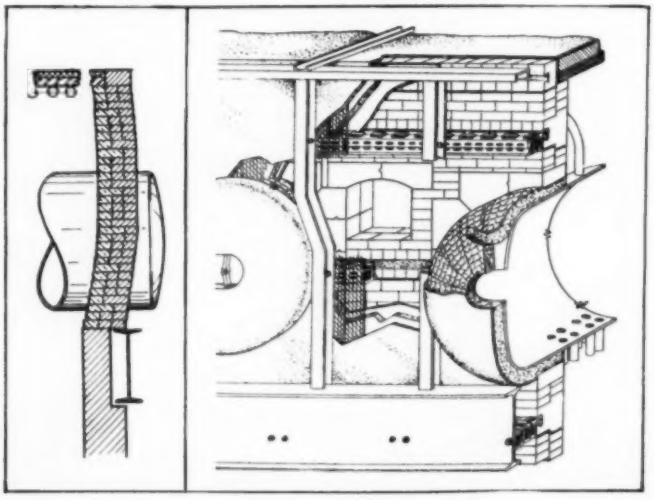
As field confirmation of the required ability for the steam generating units to follow widely varying load savings—such as, direct condensing dye vats, batch cooking of foods or chemicals, or platen presses for plastics or mechanical rubber goods—the accompanying Bailey steam flow-pressure record from a Southern textile mill is typical. Two 300 horsepower gas-fired Orr & Sembower Powermaster automatic packaged-unit boilers are operated at ratings of from 3000 lb/hr (less than 20% of rating) to 18,500 lb/hr (over 100% of rating) while maintaining constant steam pressure within a 2 psi variation in the 100 psi range.

The maximum load change was recorded during a ten minute interval when the load increased from 6500 lb/hr to 18,500 lb/hr. At that time there was a momentary pressure drop, immediately recovered, down to 95 psi. The pressure curve regularly shows pressure maintained between 98 psi and 100 psi.

Case 43—Oklahoma Glass Plant

It Pays to Know Your Boilers

The upper side wall, shown at left, supported partly by the lower wall and partly by the drum supporting girders, is pushed outward, twisting and deforming the brick rings around the boiler drum ends. Reintjes sectionally-supported walls, shown at right, applied to upper side wall areas together with drum end seals, permanently eliminate air leakage in this portion of the boiler heat enclosure.



THROUGHOUT the South there are many hundreds of Stirling type boilers. These boilers are as stable as the old plow horse when it comes to getting work done and they require a minimum of attention. However, many of the settings enclosing them do require attention.

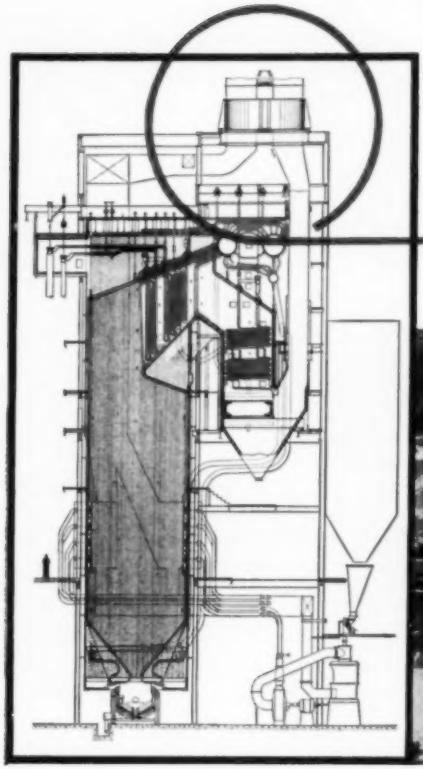
When was the last time you climbed up the dusty ladder to the top of the boiler to see the condition of the boiler upper side walls? I mean the portion of the side walls above the upper drum supporting girders. This area provides more excess air infiltration than almost any other portion of the boiler setting. The reason is obvious. At best upper walls are difficult to build, and they are located in an area that no one sees anyhow.

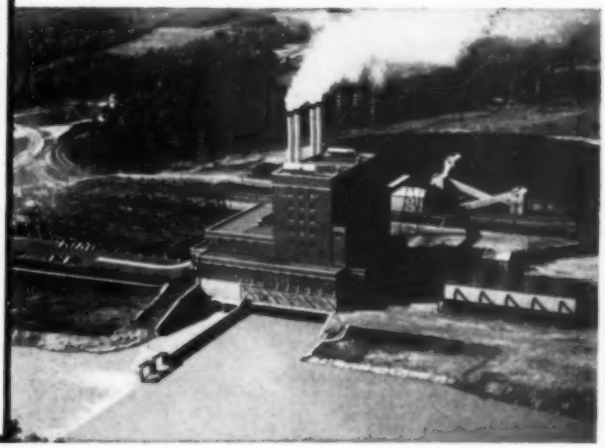
Even the best of upper walls erected by the most experienced masons present many construction problems. It is difficult to overcome the forces which tend to destroy the wall. For instance, all solid masonry walls expand upwardly, a part of the upper wall rests on the lower wall and part of it on the stationary drum supporting girder. This provides the leverage to help

All Reheat Boilers at New Lee Station of the Duke Power Company

equipped with

LJUNGSTROM AIR PREHEATERS





By mid-summer last year, both units of the first section of the Duke Power Company's new Lee Station had gone into service. Designed and built by Duke Power's own organization, Lee Station's 190,000 kilowatts help fill the growing power needs of industrialized South Carolina..

Each of the station's two 90,000/100,000-kw turbine-generators is powered by a boiler designed and built by Combustion Engineering—Superheater, Inc. These C-E Steam Generating Units are fired by pulverized coal, and furnish steam at a throttle pressure of 1250 psi and 950 F, reheated to 950 F.

Two Ljungstrom Air Preheaters are used with each boiler. These Ljungstroms preheat combustion air to 620 F and cool exit gases to 310 F.

Lee Station is another example of the unanimity with which the Ljungstrom Air Preheater is accepted as a standard unit for high-efficiency steam generators. Since the war, Ljungstrom Air Preheaters have been specified for an hourly capacity of over 285,000,000 pounds of steam.

THE Air Preheater Corporation 60 East 42nd St., New York 17, N. Y.

the walls move outwardly. The outward moving tendency is assisted by endwise expansion of the boiler drums where they penetrate through the upper walls. In addition, the upper side walls are punctured by access doors. These doors are almost invariably located between the boiler drums; thus you have reduced these upper walls to a series of "dogleg" piers supporting several feet of overhead brickwork.

To further aggravate the situation, the top portion of the wall expands endwise against the side of a ring of brick which supposedly keeps the wall off of the drums. The result is, the refractory ring cracks and presses against the drums. The outward wall must provide a gap between the roof tiles and the side walls for access air leakage.

Not long ago a Southern plant superintendent told me he was positive they had no trouble in this area of their boiler settings. However, out of curiosity he went to the boiler room with me. To his surprise, he found that the upper side walls were in the state of collapse. He immediately ordered the boiler shut down and no one was to go beneath this wall until it was torn out. The same situation occurs in many plants.

If you have any Stirling boilers in your plant, it is worth-while to get into a pair of overalls, climb the ladder to the top of the boiler and see for yourself — *Geo. P. Reintjes.*

Case 44—Louisiana Woodworking

New Boiler and Condensate Return System

THE Louisiana Veneer Mill, West Monroe, Louisiana, Originally had two 125 hp HRT boilers arranged with dutch ovens for burning waste fuel. Bark and veneer trimmings were put through a fuel hog and carried by a conveyor belt to the fire boxes of the two boilers. The veneer cores, which are clean lumber, were transported from the veneer cutting room to an area adjacent to the boiler house, on a chain conveyor. From this point, the cores had to be fed to the boiler by hand. The firing of these two boilers required at least two men on an around the clock operation, except for Saturday and Sunday shut-down.

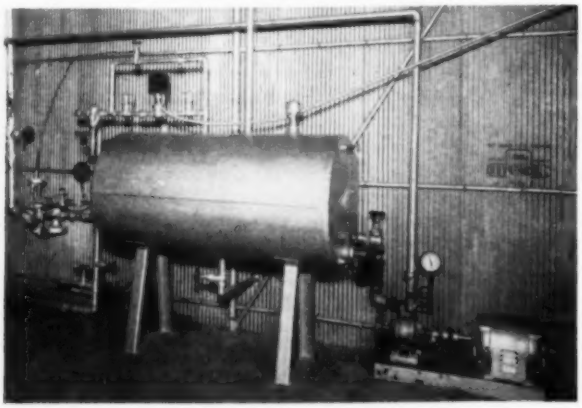
Mr. C. K. Crandall, the owner of the Louisiana Veneer Mill, found that these clean veneer cores could be sold to paper mills and decided to install a new Titusville 150 psi boiler equipped with a John Zink gas burner, together with a Schaub Pree-Heet boiler return system.

In addition to performing the functions of a conventional open type boiler return system — automatic boiler water level control, return of all high and low pressure condensate, and automatic supply of necessary make-up water — the Pree-Heet system automatically preheats the boiler feedwater to temperatures of 200-205 degrees. This minimizes boiler load shock on the boiler, eliminates most of the oxygen and other noncondensable gases which pit and corrode the boiler tubes and act as heat insulators in the processing equipment, and precipitates many of the scale forming salts in the receiver instead of in the boiler.

Altogether, the change-over has been extremely successful because the cost of the natural gas for the new boiler is paid from the sale of the veneer cores, and efficiency has also been stepped up in many ways:

1. The services of approximately six firemen were released for work in other parts of the mill.
2. Veneer drying time was reduced to a point where a run which had previously taken eight hours can now be completed in seven hours.
3. During the one hour which is gained in the veneer drying time, the crew from the veneer drying machine is used to load veneer cores into box-cars for transportation to the paper mills.
4. Formerly steam pressures varied from 85 to 130 pounds during peak loads, but now it is possible to hold pressure constant at 122 pounds regardless of the load applied.
5. The constant steam pressure enables them to produce a higher quality finished product because even temperatures are applied during the entire drying cycle.
6. Because the constant steam pressure has also alleviated several points where bottle-necks in production previously existed, an overall plant efficiency has been greatly increased.

Pree-Heet Boiler Return System



Case 45—Texas

Deionizing Method

ILLCO-WAY Deionizing units, using Dow Chemical Company exchange resins, produce 1000 gpm of boiler feedwater at Dow's magnesium plant in Freeport, Texas. Units, a product of the Illinois Water Treatment Co., are fully automatic and produce a water containing less than 2 ppm ionizable solids with silica reduced to less than .05 ppm. Boiler efficiency has been improved and shut down for maintenance on turbine generator repairs reduced over 50 per cent.

WING AUXILIARY TURBINES

Welded Steel Wing Turbine on Vertical Pump

OPERATING RANGES

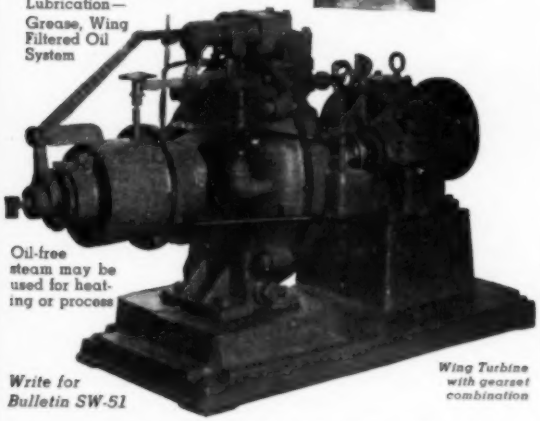
	Standard	Maximum Pressure
Horsepowers	100	150
Temperatures	525°	750°
Pressures	275	600
Back Pressures	50	50
Speeds	4000 RPM	4000 RPM

Capable of exhausting against HIGH BACK PRESSURES

Shafts—Horizontal or vertical

Rotation—Clockwise or counter-clockwise

Lubrication—Grease, Wing Filtered Oil System



Oil-free steam may be used for heating or process

Write for Bulletin SW-51

Wing Turbine with gearset combination

L. J. Wing Mfg. Co. 169 Vreeland Mills Rd. Linden, New Jersey

Factories: Linden, N. J., Montreal, Canada

Wing AUXILIARY STEAM TURBINES

ONLY CYCLONIC COMBUSTION GIVES . . .

66% MORE POWER per sq. ft. of heating surface

By reducing heating surface requirements from 5 to just 3 sq. ft. per B.H.P., Cyclonic Combustion produces 66% more power per sq. ft.—saves up to ⅓ the space of conventional package steam generators. Cyclonic Combustion is the revolutionary new flame control used exclusively in Cyclotherm steam generators. Flame characteristics are controlled in a revolving spiral vortex traveling the full length of the furnace to insure maximum heat transfer without direct flame impingements or hot spots. The cyclonic action of the flame accounts for a 65 to 75% heat transfer within the main fire-tube. This high rate of heat transfer enables Cyclotherm 2 pass generators to maintain a guaranteed minimum efficiency of 80% for any steam requirement.

Cyclotherm steam generators with patented Cyclonic Combustion offer these additional features: Full power operation from a cold start in 15 to 20 minutes; Savings up to 50% on maintenance; Greater fuel savings; Boilers designed for oil or gas operation from 18 to 500 h.p., 15 to 200 psi operation pressure.

Proved superior in thousands of installations, Cyclotherm steam generators with new Cyclonic Combustion offer the most efficient and compact package steam generator on the market today. Find out more about Cyclotherm and Cyclonic Combustion—write today for a free illustrated folder.

The Cyclotherm meets all state requirements and is built in accordance with A.S.M.E. and National Board Standards and bears the label of Underwriters Laboratories, Inc.

CYCLOTHERM STEAM GENERATORS

Cyclotherm Division U. S. Radiator Corp.
Dept. 34
Oswego, New York

Please send without obligation my copy of "All Your Questions Are Answered by Cyclotherm."

NAME _____

FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Case 46—Georgia Plywood Plant

Water Softener and Preheater Pay Off

A SOFTENER with Permutit "Q" high capacity zeolite resin is used to remove hardness of well water supply, thus preventing scaling of feedwater lines and boiler tubes. Elimination of the scale-forming constituents in the water leaves piping and boiler tubing free of scale, but bare metal would be exposed to corrosion if the oxygen and free CO_2 were not removed.

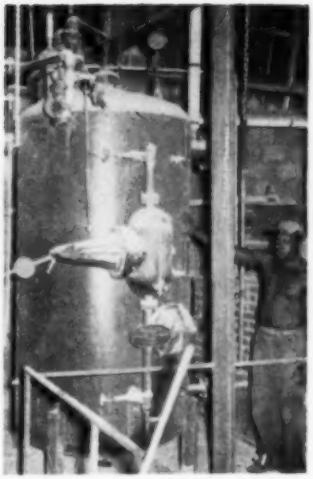
Therefore, the softened water and condensate returns are passed through a Permutit open heater where oxygen and free CO_2 are removed.

This treated water going to the boiler prevents scaling and corrosion of boiler tubing and feedwater lines, and greatly reduces maintenance and repair costs.

Chemicals are fed to the boiler feed pump suction to maintain the usual phosphate residual in the boiler water, and antifoam compound is also added.

A continuous blow-off heat exchanger is used to recover heat from blow-off water.

Prior to this installation we were continuously bothered with shutdowns due to scale forming in the tubes and causing blistering of the tube walls, which resulted in blowouts and costly replacements.—*Hoke B. Smith.*



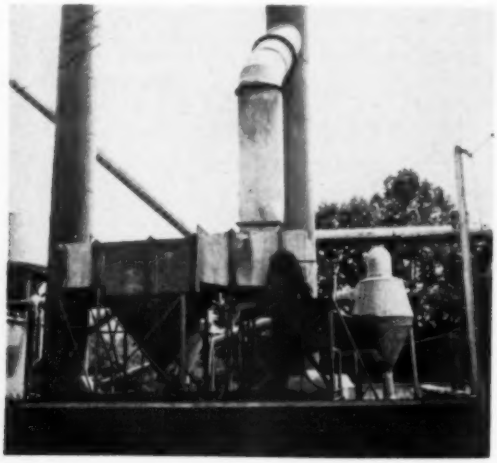
Vertical spray type *Permutit* heater at Bradley Plywood, Savannah Plant.

Case 47—North Carolina Furniture

Fly Ash Arrestor Eliminates Nuisance

DREXEL Furniture Co., manufacturers of high quality bedroom and dining room furniture, are able to supply practically all the fuel needed for their two 250 hp boilers from the sawdust and wood scrap, which is a waste product of their process. Only in the winter do they have to add a little coal to meet the demand for steam.

As pleasant as this cheap supply of fuel might seem to purchasers of coal, oil, or gas, it had one serious drawback in that the boilers did not completely burn the wood in the combustion chambers, and a heavy, charcoal laden smoke from the stack was a nuisance throughout the neighborhood. It was so thick that fly ash covered the ground about the plant, and several neighboring housewives threatened to sue every washday.



Two years ago, Drexel had a fly ash arrestor installed by the Fly Ash Arrestor Co., of Birmingham, Ala. It has turned out to be an excellent investment, for not only has it completely eliminated ash, so far as the eye can see, but it has increased the efficiency of the boilers so that even though the steam load has been greatly increased, no more coal has to be purchased in winter than was purchased previously.

Two stacks were originally used, one for each boiler. When the fly ash arrestor was installed, one stack was dampered so that it is closed in regular operation, and gases from this boiler pass through the arrestor with the gases from the other boiler and both go out one stack.

In the arrestor, gases from both boilers are separated from the fly ash which they have carried out of the furnace. This fly ash is returned to the furnaces and reburned. Since it is practically pure charcoal, it is perfectly good fuel.

There is some loss of draft through the fly ash arrestor and since only one stack is used, an induced draft fan is incorporated as part of the installation.

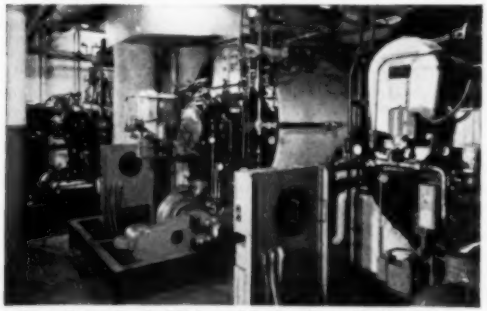
It is possible to open the unused stack, route all flue gas through it, and cut out the fly ash arrestor in the event that maintenance is required. However, Drexel has found that the installation has operated well over the two years it has been in service, and it requires very little maintenance.

The master mechanic also stated that the boilers have been much easier to clean since the fly ash arrestor was installed. Previously he had to blow soot every day. Now it is only blown once a week or twice a week at most.

In this modern newspaper building passersby can see running presses through 11 ft. plate glass windows, located directly behind flag pole in this picture.

WASHINGTON POST BUILDING, Washington, D. C. Albert Kahn Associated Architects and Engineers, Inc. John McShain, Inc. — General Contractor. Standard Engineering Company, Engineers and Contractors.

THE WASHINGTON POST'S new 7-story building is heated by a combination of a hot blast ventilating system for the inside areas and convector radiation along the outside walls. The steam distribution system is divided into two sections, one supplying the fan blast coils at 3 lbs. to 5 lbs. pressure and one supplying the radiation at 3 lbs. to 5 lbs. pressure.



Three Cleaver-Brooks 150 hp., oil-fired, self-contained boilers were easily and quickly installed in low headroom, basement space.

Three Cleaver-Brooks 150 hp. oil-fired, self-contained boilers, installed in the basement location, supply steam for the entire heating system.

Modern Cleaver-Brooks boilers are increasingly specified for heating service. Completely self-contained and compact in design, requiring minimum headroom and floor area, Cleaver-Brooks boilers offer many installation and operating advantages — oil, gas, or combination oil and gas firing — fully automatic — clean — dependable performance — operate at a guaranteed efficiency of 80%. Available in sizes from 15 to 500 hp., 15 to 250 psi.

Write for the latest, fully illustrated Steam Boiler Catalog — Cleaver-Brooks Company, Dept. L, 30? East Keefe Avenue, Milwaukee 12, Wisconsin, U.S.A. *Cable address*: CLEBRO-Milwaukeewis.

Cleaver-Brooks
Originators of Self-Contained
STEAM BOILERS

Oil and Bitumen Tank-Car Heaters • Distillation Equipment • Oil and Gas-Fired Conversion Burners

Case 48—Texas Chemical

Demineralizing Boiler Makeup Water

A LARGE chemical manufacturer with plants located on the Gulf in Texas recently installed 1250 psig boilers with a capacity of 450,000 pounds per hour in connection with a large production expansion program.

Most of the steam is expanded through turbines to process and only a small proportion of the condensate returns to the boilers. An average 600 gpm of makeup water is required for these boilers and the quality has to be equivalent to condensate in order to prevent scaling of the boiler tubes and to avoid silica deposits in the turbines.

The raw water available contained up to 1200 ppm total dissolved solids. In order to remove practically all of the electrolytes and silica from this water supply, a double train, two-bed demineralizing plant was designed and fabricated by the Graver Water Conditioning Company. Since hydrochloric acid is manufactured by this company and is available at low cost at the plant, it is used to regenerate the styrene resin in the cation exchange units. Sodium hydroxide is used to regenerate the strongly basic anion exchange resin in the second unit which removes all of the acids including silicic acid. The water leaving these anion units then flows through a vacuum deaerator which reduces dissolved oxygen below 0.2 ppm in order to avoid corrosion of piping and storage tanks. Regeneration of the units is automatic with push-button initiation by the operator.

Since this plant has been in operation, it has consistently turned out a water containing less than 4 ppm total electrolytes and less than 0.05 ppm silica.

Case 49—Florida

Florida Laundry Goes All-Electric

EMPHASIS on absolute in-plant cleanliness led a Florida diaper laundry to the decision to change from the original coal-fired boilers to electric immersion heaters for steam generation and hot water supply.

Application engineers of the Edwin L. Wiegand Company were brought into the picture to help work out the heating requirements for the three wash wheels, two extractors, two dryers and five tumblers. A steam generator and hot water heater were designed to fill the requirements.

Based on an 8 hour day, the steam generator will produce approximately 8240 lb of steam at 100 lb pressure, an equivalent of 34.3 boiler horsepower, while the hot water heater will yield some 10,570 gallons at 190 F.

With the accumulator capacity provided, 3030 lb of steam can be generated "off-peak" at night and stored for daytime use. The seven Chromalox circulation heaters can generate an additional 5216 lb of steam during the 8 hour day.

The hot water tank has a storage capacity sufficient to give 4,764 gallons of 190 F water, while the nine 24 kw immersion heaters will produce heat equivalent to an additional 1,726 gph, or 5,808 gallons in the 8 hours.

Seventy-five thousand diapers make a good day's production and a big processing problem. Production benefits from the changeover include automatic operation of the steam and hot water system, improved cleanliness, and low maintenance costs.

Case 50—West Virginia

Steam Plant Handles High Peaks at Low Cost

ENGINEERS designing a replacement steam plant for the Calco Chemical Division of American Cyanamid Company at its West Central Virginia pigment plant had the advantage of knowing from experience in the old plant exactly what was required. Therefore, the new plant — burning bituminous coal from Southern Appalachian fields — is specifically matched to the operating requirements which include load swings of from 50,000 to 90,000 pounds in sudden surges.

Contrasting with the old plant efficiency of 60 per cent, the new plant has a nominal efficiency of 85 per cent at its rated steam capacity of 80,000 pounds per hour, and is producing steam at a total average cost of 65c per thousand pounds, including depreciation and all operating and maintenance expense.

Details of this installation with continuous ash discharge spreader stokers, air preheaters, cinder return, over-grate air supply, and complete automatic controls, will be presented in an illustrated description of this plant in the December issue of Southern Power & Industry. The author is *C. A. Reed*, Director of Engineering for the National Coal Association.

More Information Available

Many of these modern procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case histories in this 5th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N. E., Atlanta 5, Georgia. There is no obligation.

FARRELL-CHEEK CRANE WHEELS

Serve Four to Eight Times Longer!

Reports from users of Farrell-Cheek pressure-cast steel crane wheels say they get from four to eight times longer service than with other types of wheels. You can have the same performance on your cranes. We can quickly give you the reasons for using F-C wheels.

F-C wheels stand up to continuous hard use because they are made with the finest available materials in a completely modern plant. Farrell's famous steel alloy "85" offers a superb combination of physical properties—high yield strength, toughness, hardness, and high resistance to wear and abrasion. Another special alloy, F-C Hard Edge, protects critical surfaces against wear. Also, F-C wheels have been designed and tested to withstand both static and impact loads. The records of hundreds of installations show they perform even beyond the high standard indicated by their fine materials, and expert design and manufacture.

F-"85" is a special purpose cast steel which can be heat treated through selective processing. Treads and flanges are toughened and hardened for maximum resistance to shock and abrasive wear.

HARD EDGE tests from 500 to 650 Brinell, is used on treads and flanges in a depth ranging from 1/8" to 3/16", depending on size of wheel. It is backed up with a softer steel alloy with a Brinell of from 285 to 315.

Either standard or special designs can be furnished. You can save yourself the cost of frequent wheel replacements by starting now to use Farrell-Cheek crane wheels. Write today for detailed information.

FARRELL-CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car
R. R. Specialty Castings.

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened, Ground.

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.

SPECIALIZED CASTINGS
Light Section Castings.

STOKER PARTS
Feed Screws, Furnace Tools, Flanged Pipe, etc.

HEAVY HARDWARE
Wire Rope Fittings, Choker Hooks, Bar Benders, Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

• • • SANDUSKY, OHIO U.S.A.

Section 7

Maintenance Procedures

Repairs to worn metal surfaces . . evaporative cleaning . . anchoring machinery . . stack coatings . . steam cleaning . . steam lubrication from less oil . . lubricants reduced . . machinery vibration problems

Case 51—North Carolina Paper Mill

Track Down Grounds With Your Power On

SEVERAL months ago we purchased an Allen Ground Detector and have found it a tremendous aid in maintaining better production in our paper mill. It rapidly detects and locates grounds in electrical distribution circuit and equipment without stopping production.

The portable equipment consists of a signal receiver and a signal generator. Receiver is an induction type instrument which will register a signal current as low as ½ amp even through conduit. It is carried in the hand and when placed on or near the cable at the fault, gives a pulsating indication through the conduit. When the point at fault is past, the meter will cease to pulsate. A separate 115 volt, one phase, 60 cycle control circuit operates the automatic impulse signal. One meter indicates the phase at fault or grounded and another registers the signal current. A test button indicates the intensity of the ground.

Plant Applications

The detector will work on d-c systems as well as a-c. We recently had a ground on the d-c system of our washer drive motors. We used two 500 watt lamps in series and connected to the hot wire of the 230 volt d-c system. The electrician set up a flashing or signal system by grounding the light circuit, lighting the lamps each time he grounded to the steel structure.

With the Allen ground detector, another electrician followed the d-c line from the generator to the fault on a washer motor. This was a totally enclosed fan cooled motor and we found that carbon dust and a small amount of grease had collected from the bearing to the brush arm stud in a composition insulating ring. Current to ground had charred the insulating ring until the stud was about to fall out. Motor was repaired and a ground then showed up on the other leg. The detector then led us to another motor under the same condition but the opposite polarity. We found three motors in bad condition but

Operator at the left observes grounded phase and actuates automatic switch to superimpose impulse signal current on grounded line without interruption to normal production operations. Hand unit signal receiver at the right picks up signal right through bus way. Needle of the microammeter gives a pulsating indication until point at fault is past. The Allen Ground Detector is a product of the *Ferr Manufacturing Company* and distributed by the *Excel Electric Service Company*.

all were "picked up" before a shutdown failure. Our motors have a regularly scheduled clean-up time when the washers are down. However, the ring setting was so close to the end bell, that the carbon collection could not be seen or cleared out without taking off the brush rigging ring.

This is one typical case history emphasizing that the detector is a very useful test instrument in our electrical department. Our unit is portable and we move it wherever needed.—*Chief Engineer.*

Case 52—Arkansas Lumber Mill

Repair of Worn Parts by Metallizing

POINSETT Lumber and Manufacturing Co. of Trumann, Arkansas, is now making good use of the metallizing process in many types of repair work.

Metallizing is a highly developed method of spraying molten metal so that it will adhere to practically any solid base. Glass, wood, plaster, cloth, cement, paper, Plaster of Paris, brick, tile, and metal can be coated by this process.

Our use of this process has been confined entirely to its application to metal. It provides an extremely efficient method of making repairs to worn metal surfaces. This method is of particular value in repairing worn motor arbors. It is not necessary to press the arbors out of the rotor to build up worn places. The metallizing equipment is manufactured by Metallizing Company of America, Inc.

The metallizing unit is composed of two main parts, the feed mechanism and the gas head or nozzle. The gun operates wholly on compressed gases: air (oxygen) and either hydrogen or acetylene. The gases and air are conducted into the gas head after passing through a main control valve which regulates all of the gases with one movement.

A. H. Bays, Works Engineer
Poinsett Lumber & Manufacturing Co.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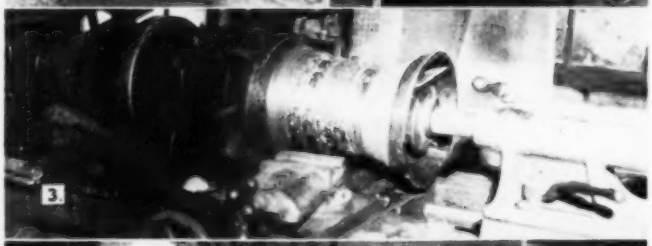
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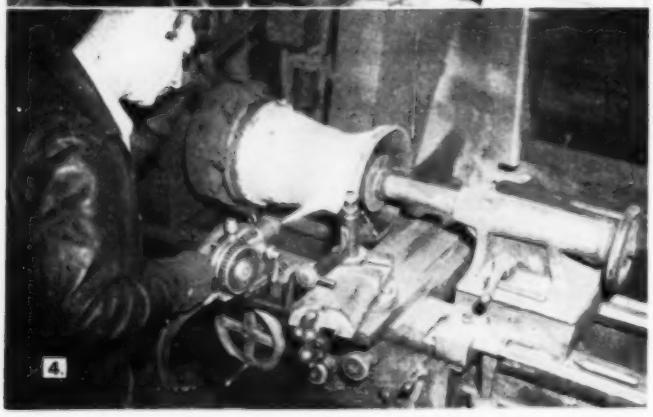
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To illustrate this process we have selected at random a characteristic repair job. The metal drum on the capstan on our Lumber Delivery Car was badly worn and required replacement or some kind of repair.

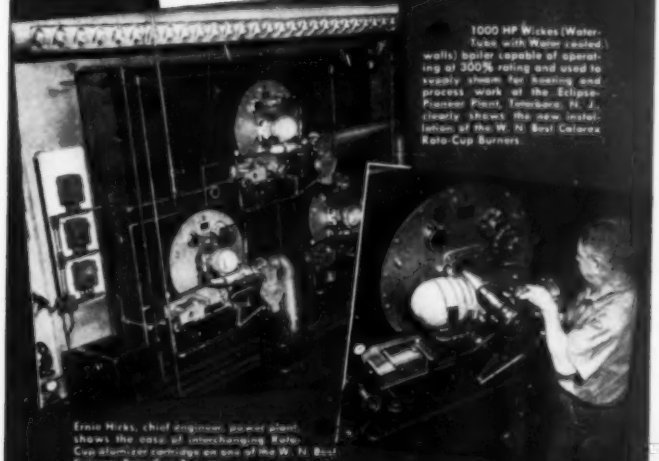
Fig. 1 shows the capstan drum after it was completely repaired and reinstalled ready for use.

Fig. 2 shows the damaged drum before any repairs were made. Note the badly worn places in drum requiring repairs.

Fig. 3. Capstan drum in lathe being trued up and threaded ready for the metallizing process. Surface is not turned smooth but is left "threaded" to form a proper surface for receiving the molten metal.

Fig. 4. Capstan drum in lathe showing the method of building up a coating of the molten metal to replace the metal worn away. The metallizing gun is supported on the lathe frame, metal wire is being fed into the metallizing gun and the molten metal spray is being applied to the drum as it turns in the lathe.

MEMO TO...
Consulting Engineers
....Plant Engineers:
W. N. Best counsel and advice can help you solve your fuel burning problems.



1000 HP Wickes (Water-Tube with Water cooled walls) boiler capable of operating at 300% rating and used to supply steam for heating and process work at the Eclipse-Pioneer Plant, Teterboro, N. J., clearly shows the new installation of the W. N. Best Calorex Rota-Cup Burners

Ernie Hicks, chief engineer, power plant, shows the ease of interchanging Rota-Cup atomizer cartridge on one of the W. N. Best Calorex Rota-Cup Burners.

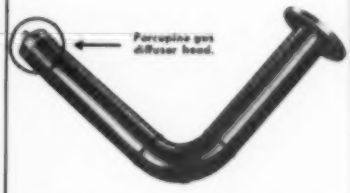
10 YEARS of Efficient, Maintenance-Free Operation at Eclipse-Pioneer

W. N. BEST
COMBUSTION EQUIPMENT CO.
413-15 ELEVENTH STREET
CARLSTADT, NEW JERSEY

IF YOU USE GASEOUS FUEL...

You will discover the W. N. Best Calorex Gas Burner or combination oil-gas burner provides, the same top efficient performance with minimum maintenance as established at the Eclipse-Pioneer Division of the Bendix Aviation Corporation Plant, Teterboro, New Jersey.

Here is a simple, easy-to-service, interchangeable gas burner, featuring a high characteristic of intimate fuel-air mixture that provides the very maximum of combustion efficiency under steady or highly fluctuating fuel firing rates.



W. N. Best Calorex Gas Burner cartridge replaces the Rota-Cup Atomizer cartridge to provide efficient gas operation.

The high efficiency rate and throttling range is accomplished through the combination of W. N. Best's porcupine gas diffuser head and exclusive Calorex Combustion Air Register.

The W. N. Best Calorex Gas Burner is available for the firing of all types of high heat unit content gaseous fuels.

Additional information and descriptive literature is available by writing directly to W. N. Best Combustion Equipment Co., 411-15 Eleventh Street, Carlstadt, New Jersey.

Case 53—Alabama

Preventive Bearing Maintenance Pays

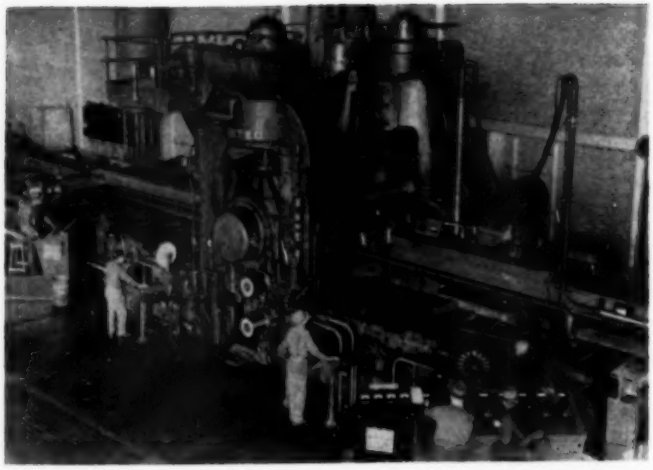
THE Reynolds Alloys Co. installed four high hot and cold strip rolling mills at its Listerhill, Ala., plant in 1941. The mills, built by United Engineering and Foundry Co., Pittsburgh, Pa., were equipped with SKF anti-friction bearings on all roll necks and gear drives.

After 11 years of service, 95 per cent of the original bearings are still in operation. SKF credits this remarkable record largely to the preventive maintenance program which was developed jointly with the Reynolds organization.

The program includes bearing inspection at scheduled intervals. Reynolds has originated devices for handling and manipulating very large bearings weighing 3,800 pounds.

Both back-up rolls and work rolls on the mill are equipped with spherical roller bearings. The rolling alignment of the spherical bearings compensates for machining and setup errors, and accomodates shaft deflections, distortions, or weave. This type bearing makes maximum load-carrying capacity available at all times.

Consistent and reliable bearing performance has permitted continuous high production operation, to close gauge control, at the Reynolds mill, which supplies critically needed aluminum sheet and strip. This has resulted in one of the lowest "cost per ton" bearing replacement records in the industry.



4 High Aluminum Rolling Mill, designed and built by *United Engineering & Foundry Co.*, installed at Reynolds Listerhill, Ala., plant in 1941, still rolls along on original *SKF* bearings 11 years later.

Case 54— Florida Paper Mill

Black Liquor Evaporator Cleaning

A FAST and efficient method of cleaning multiple effect black liquor evaporators, both vapor and liquor sides, has been reported by Dowell Incorporated. The following is a brief summary of the cleaning procedure used on two sets of Swenson Black Liquor Evaporators in a southern pulp and paper plant, together with operating data before and after cleaning.

The two sets of evaporators were found to contain different types of deposits. As a result they presented individual cleaning problems requiring specific procedures and chemical solvents in order to most efficiently clean each set.

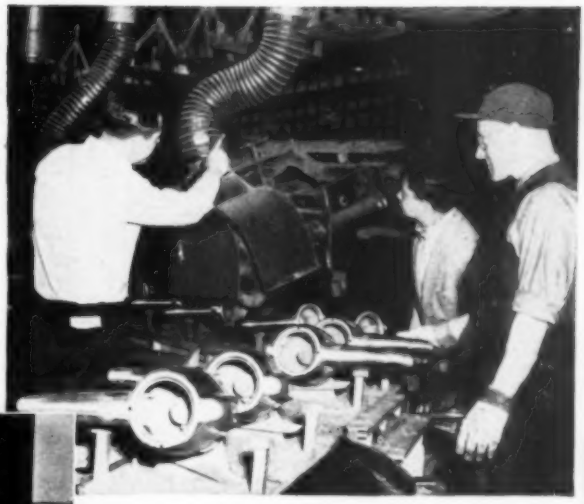
Samples of deposits from the vapor side of the #4 effect of the "A" set of evaporators were taken for laboratory examination. The average thickness of the deposit on the tubes was 1/32 inch. It consisted of a black, sludge type material which dried to a black cake composed of small grayish-black flakes. Chemical analysis showed 27% organic material, the remainder consisting of iron oxide with a small percentage of iron sulphide.

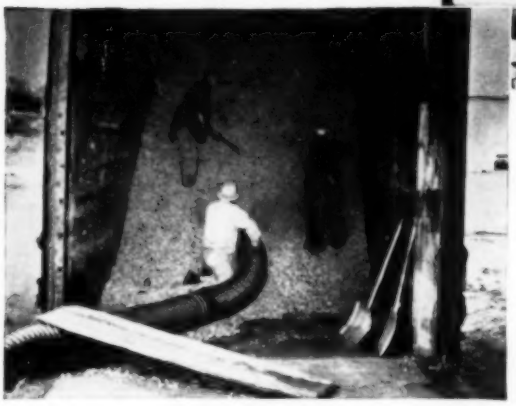
The cleaning treatment consisted of a 12 hour preboil of the vapor bodies of #2, 3, 4, and 5 effects, using a 20% caustic soda solution, containing a wetting agent and detergent. Each effect was then flushed by alternates filling and draining with hot water. The vapor sides were then filled with a 10% inhibited hydrochloric acid solution containing a wetting agent. The deposits were allowed to soak in this solvent for a period of 5½ hours. At the same time, the liquor sides of the same effects were filled with a 5% inhibited acid solution. Following the soaking period, the acid solvent was drained and the units flushed thoroughly with water.

Inspection of the units following the treatment showed both vapor and liquor sides to be free from adhering deposits. Considerable sludge that had accumulated on the bottom tube sheet, was readily

	EVAPORATOR SET "A" Before Cleaning	EVAPORATOR SET "A" After Cleaning	EVAPORATOR SET "B" Before Cleaning	EVAPORATOR SET "B" After Cleaning
Feed Liquor	201 gpm.	221 gpm.	307 gpm.	308 gpm.
Solids—Feed Liquor	13.6%	13.9%	13.2%	13.9%
Solids—Conc. Liquor	44.9%	46.7%	42.8%	46.0%
M. Lbs. Black Liquor/Day	337	359	495	537
M. Lbs. Water Evaporated/Day	1717	1920	2606	2640
M. Lbs. Steam Used/Day	543	535	688	614
Water Evaporated/Lb. Steam	3.16	3.59	3.81	4.31

Whether
DUST REMOVAL
or
MATERIALS HANDLING





You can install SPIRATUBE® yourself

Whether your application requires dust removal . . . or materials handling . . . you can set up your lines of SPIRATUBE to meet your requirements. AND . . . what's more important — you can do it yourself. That cuts downtime to a minimum, and enables you to keep your ducting system in operation to meet your production needs.

SPIRATUBE — the new type flexible tubing — connects quickly, easily to your present lines . . . and bends anywhere with minimum crimping. No turn is too short, no angle too acute. No elbows or special fittings to bother with in going around obstructions!

And — important to you too: The initial cost of SPIRATUBE is small . . . and its life equals — sometimes exceeds — rigid ducts.

Standard sizes for all requirements are immediately available from well-stocked distributors — coast-to-coast.

FOR ALL DUCTING SYSTEMS: **FLEXFLYTE®** **SPIRATUBE®** **AYRTUBE®**

Flexible Tubing
CORPORATION

Guilford, Connecticut **Pasadena 1, California**

FREE! Full details on this amazing, cost-saving ducting. Fill in coupon and mail

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Please send me your new catalog on Flexible Tubing products.

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City_____ State_____

hosed out with water. The cleaning treatment and wash-out were completed in 24 hours and the units returned to service immediately thereafter.

Deposits from the vapor side of the "B" set of evaporators were examined and proved to be similar to those found in the "A" set. The deposits from this second group, however, contained a lower proportional amount of organic material and a correspondingly higher percentage of iron oxide. Solubility tests indicated that stronger acid solutions and longer contact times would be required.

On the basis of laboratory recommendations, the Evaporator Set "B" was serviced by filling the vapor sides of #2, 3, 4, and 5 effects with a 14% inhibited hydrochloric acid solution, containing wetting agents and a detergent. The caustic preboil was unnecessary in this instance, because of the low organic content of the deposit. The vapor sides of these units were allowed to soak in the acid solvent for eight hours. At the same time, the liquor sides were soaked in a 5% inhibited acid solution for a period of five hours. All effects then were drained and flushed with neutralizing solution. The entire cleaning operation, including inspection and final washing out with water, required only 20 hours.

As an indication of the increase in productive efficiency obtained by servicing these evaporators, the accompanying table lists pertinent data.

Case 55—Texas

Anchoring Precision Machinery

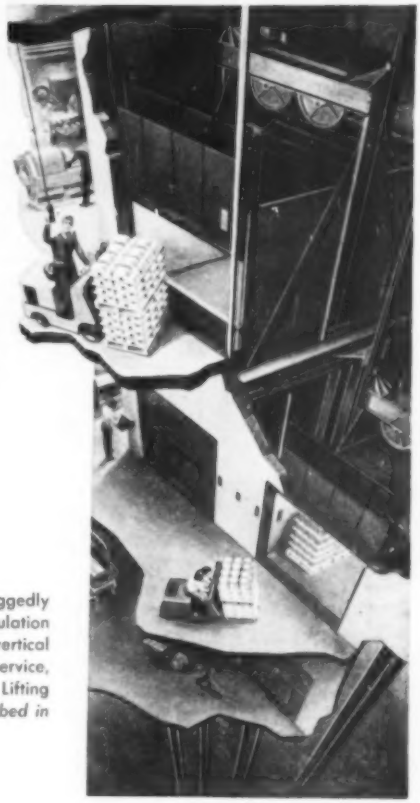
LEAD and sulphur, normally used for setting machinery anchor bolts in a Southern airplane factory were in short supply. And furthermore, vibration soon loosened the bolts and the machines had to be reanchored at frequent intervals.

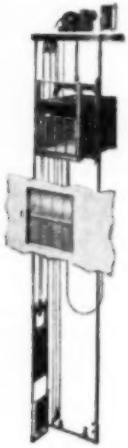
The problem, then, was to provide a bolt-setting material which would: set up rapidly; hold the bolt rigidly and permanently in place;

built to AVOID COSTLY SHUTDOWNS

You've watched power trucks in action. They may weigh 8,000 pounds, or more, plus a proportionately heavy pay load. They're speedy, hard driven, fast stopping. They punish the elevator platform and structure with a wide variety of vertical and horizontal impact forces that tend to thrust, tilt and twist the entire elevator structure.

This is an extreme example of the daily operational stresses placed on power truck elevators. But it applies, in a like degree, to all freight elevators. So be certain to look beyond basic specifications when you buy. Look for the extra ruggedness that Otis builds into freight elevators — *to insure continuous day-after-day service!*



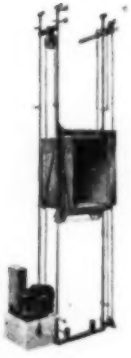


HEAVY-DUTY SERVICE

where industrial trucks are used. Otis POW-R-TRUCK elevators are especially built to withstand power truck punishment. Lifting capacities range from 8,000 to 20,000 lbs. *As described in Bulletin B-705.*

GENERAL-DUTY SERVICE

for factories, warehouses, or garage installations. Ruggedly built. Available with Unit Multi-Voltage speed regulation and "Micro" two-way, self-leveling. Otis all-steel, vertical bi-parting doors. For large openings and intensive service, power operated doors and gates are recommended. Lifting capacities range from 2,500 to 10,000 lbs. *As described in Bulletin B-382.*



LIGHT-DUTY SERVICE

where space conditions are limited. Otis SELF-SUPPORTING elevators have a self-supporting framework that permits installation in new and most existing hoistways without reinforcing the building, without adding overhead supports, and without building a penthouse. For 2 or 3 floor service. 1,500 to 2,500 lbs. lifting capacities. *As described in Bulletin B-720.*

SIDEWALK SERVICE

to one or two basement landings. Simple — but safe — operation is by means of key switches at the sidewalk level and UP and DOWN buttons at lower landings. Travel is 25 fpm. Lifting capacities to 2,500 lbs. *As described in Bulletin B-382.*

More than half of the world's freight moves on Otis elevators. Our broad experience is available, without charge, to everyone.

In addition to our planning service, we're ready to provide 24-hour-a-day service on a nation-wide basis through 266 offices. Otis Elevator Company, 260 11th Avenue, New York 1, N. Y.

Otis

FREIGHT ELEVATORS

permit installation with a minimum of manpower; eliminate the accident hazard; cost less for raw materials than lead or sulphur; and be immediately available in unlimited quantities.

Use of Por-Rok Quick Setting Cement — recently developed by The Hallemite Company—was recommended as a desirable replacement for lead and sulphur to set the bolts in the concrete floor.

Naturally, the men responsible for this phase of the plane company's operation insisted upon conclusive proof. So at their request and with their cooperation and supervision, the following convincing experiment was conducted.

A hole only 1½ inches in diamter and only 3 inches deep was drilled into the concrete. A standard ¾-inch bolt was anchored in this hole by means of the cement. A 6-inch I-beam was placed across two 30-ton jacks—one on each side of the bolt. The bolt was then fastened to the I-beam with a dynamometer suspended in the linkage between the beam and the bolt to measure the pull. The I-beam was then raised by means of the powerful jacks. The bolt broke under a pull of 22,500 pounds, leaving the stub still firmly anchored in the hole.

On the basis of the above test, Por-Rok was put into actual use, and extensive applications throughout the plant have proven entirely satisfactory.

Case 56—Missouri

Lubricant for Conveyors

BELLAS Hess, Inc. of Kansas City, Missouri specialize in women's wearing apparel. Their warehouses and shipping facilities are quite extensive and provided with modern equipment for economical handling of merchandise.

They have nearly a half mile of belt conveyors, and the efficiency of maintenance is an important factor since this equipment must be in constant operation.

Some time ago they were constantly annoyed by frequent stoppages and repairs occasioned large-

ly because of the number of out-of-order bearings which occurred due to the lack of grease or the wrong grease.

The greases they had tried would either turn to oil or dry and gum up and thus offer no lubrication. Then Lubriplate, manufactured by Fiske Brothers Refining Company, was given a thorough test.

The manager states that since then no other lubricant has been used. They have found it to have good film strength. It stays in the bearings and provides the lubrication required so that conveyor stoppages no longer occur, and maintenance of this equipment is now a negligible factor.

Case 57—Louisiana

Weathersealing Insulation

AN OIL refinery at Baton Rouge discovered that moisture had penetrated the insulation on its cracking towers. The insulation had become watersoaked, but this was not detectable on the surface. For this reason, much time elapsed before the wet insulation was noticed. In the meantime, the steel towers began to rust because of the soaked insulation held against them. When the insulation was finally removed, large pieces of rust clung to it.

The rusty surface was cleaned and new insulation was coated with Insul-Mastic. This is a heavy mastic coating having a Gilsonite base and is applied by spraying. The Insul-Mastic weatherproofed the insulation so that rain no longer comes into contact with it. The insulation now is fully efficient; the towers are no longer rusting; and less fuel is being used to heat the towers because of the dry insulation.

Case 58—Missouri

Stacks Protected

SPECIALLY formulated Vinylite resin-based coatings developed by Surface Engineering Company, Inc., Wichita, Kansas, were used to recondition six huge stacks on the Cahokia Power Plant of Union

BJ

engineered answers to pumping problems

FILE 513
MECHANICAL SEAL

1 PACKING COULDN'T TAKE THIS KILLING COMBINATION OF TOUGH METAL CUTTINGS AND GRINDING WHEEL GRIT...

2 RESULT...THIS IMPORTANT SURFACE GRINDER WAS DOWN EVERY TWO MONTHS FOR COOLANT-PUMP PACKING REPLACEMENT

3 BUT...THIS BJ TYPE L MECHANICAL SEAL SOLVED THE PROBLEM!

4 NOW THIS SAME COOLANT PUMP HAS OPERATED FOR OVER A YEAR AND A HALF WITHOUT ANY LEAKAGE!

FILE FACTS:

- BJ Type L Mechanical Seal replaced packing in pump stuffingbox October 5, 1950, and has operated without any leakage or attention ever since.
- A BJ Bilton pump (1½" – 1½ H.P. – 50 gpm) used to pump coolant continuously at full capacity 18 hours a day.
- Machine – surface grinder, used for finish grinding of large castings, hard steel bearings and bronze fittings.

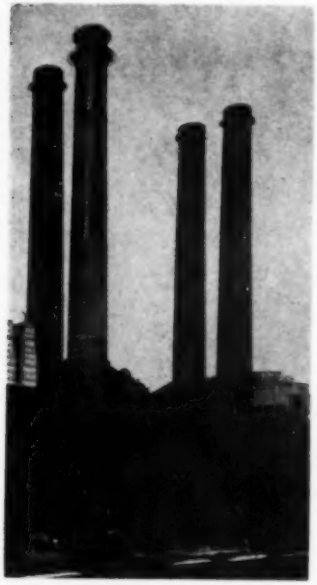
For more detailed information on BJ Mechanical Seals write for Bulletin #53-10000, Byron Jackson Co., Dept.

Byron Jackson Co.
Since 1872
P. O. Box 2017 Terminal Annex, Los Angeles 54, Calif.
OFFICES IN PRINCIPAL CITIES

Electric Power Company, St. Louis.

The extreme resistance to strong acids, bases and most corrosive chemicals afforded by Vinylite resins, on which the coatings are based, protects the mortar and steel structural bands of the giant stacks. Easy to apply with conventional spray equipment, this coating also withstands heat, contraction, expansion and sway action of the tail stacks. Elongation properties of 200 per cent account for the resilience of this coating.

When completely covered by the Vinylite resin-based coating, each stack has a one-piece, seamless seal against transmission of dust, corrosive vapors and moisture. This non-porous coating does not gather nor hold soil readily and can be cleaned when necessary with soap, water or strong detergents. Generally applied in a single coat, the spray dries almost immediately on contact and adheres strongly to cement, wood, metal, plaster, cinder block and other materials. Resistance to flame, deterioration and the major groups of mould and mildew are additional valuable properties of Vinylite resins.



Four of the six stacks on the Cahokia Power Plant of the Union Electric Power Company in St. Louis, reconditioned with Vinylite resins, coatings distributed by *Surface Engineering Company, Inc.*, Wichita, Kansas.

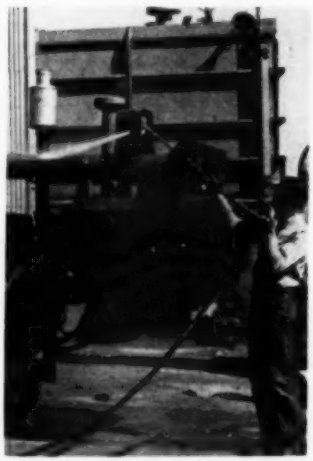
Case 59—Texas

High Pressure Steam Cleaning

THE R. G. LeTourneau manufacturing plant at Longview, Texas, test drives all their Tournadozers before final painting. After several hours in Texas clay, they are covered with dust and mud. Add road oil, grease, and dirt picked up during fabrication and you have a real cleaning problem.

A vapor pressure type of cleaner was tried but had neither the pressure nor the volume to do a satisfactory job.

LeTourneau production men now use a gas fired, high pressure, high volume Model 327 steam cleaner, a product of the Malsbary Mfg. Co. It takes only about 48 minutes to clean the Tournadozer for subsequent painting operations. Paul Broadstone, Production Engineering Supervisor at the Longview, Texas, plant emphasizes that this method of cleaning has proven to be the most economical for removing the grease and dirt, leaving the surface suitable for finishing operations.



Malsbary Model 327 steam cleaner removing dirt, grease, and oil from a Tournadozer at the R. G. LeTourneau fabricating plant in Longview, Texas. Using 900 gph at 400 psi, it takes 48 minutes to complete the job. Cleaner also features simultaneous operation of both cold water and hot solution guns.

Which **one** counts most?

Of all the 2708 men and women who make up Bell & Zoller Coal Company, *no single individual is most important!* Just as in any other business, coal production takes a lot of people doing a lot of different things to keep the ball rolling. And it takes teamwork too. Serving the folks who buy Bell & Zoller coals is a job in which each miner, driller, loader, clerk, salesman and executive plays a vital part. Every one of them—and their families, too—have an important stake in how well the job is done.

Ours isn't exactly a huge organization, nor is it a small one, by any means. But man for man and woman for woman, we don't know of one *anywhere* that does a better job of working together to see that every customer gets the utmost of service and satisfaction.

COAL HEATING SERVICE

BELL & ZOLLER COAL COMPANY

BELL BUILDING, CHICAGO 1, ILLINOIS

ST. LOUIS • NASHVILLE • OMAHA • MINNEAPOLIS

Sixty-Five Years of Service to Coal Users

Producers of
ZEIGLER, MOSS HILL, ORIOLE, MURDOCK, JEFFCO, BUCKHORN AND MOUNT OLIVE Coals

Sales Agents for
Mulberry Hill Coal Company
Freeburg, Illinois

Otter-Eagle Coal Company
Lockwood, West Virginia

Boone County Coal Corporation
Sharples, West Virginia

Case 60—Louisiana

Special Corrosion Problem Licked

CORROSION developing on crankshaft bearing sleeves after re-babbitting presented a problem to a Louisiana crude oil pipeline company operating large compressor engines. The crankshaft sleeves from these engines are of cast iron, and in order to get the babbitt to adhere the inside surfaces of the sleeves are fluxed using zinc chloride and aluminum chloride. After fluxing, babbitt is poured at 700 to 750 F. In the next step, the babbitted sides are machined. The problem was that of corrosion setting in on the back sides of the sleeves several hours after the machining, and pin-pointing through the babbitt, thus producing a poor bearing surface.

Company officials decided to call in the local technical service representative of a firm manufacturing industrial cleaning and related materials for his recommendations. After careful study of the problem, he recommended—and it was decided to employ—the following ten-step procedure for cleaning the sleeves prior to fluxing and re-babbitting and to prevent subsequent corrosion: (1) Soak sleeves for 10 minutes in heated solution of Oakite Composition No. 61, a specialized detergent; (2) cold rinse, 1 minute; (3) hot rinse, 1 minute; (4) flux; (5) babbitt; (6) neutralize, following same procedure employed in Step 1, 5 minutes; (7) cold rinse, ½ minute; (8) hot rinse, 1 minute; (9) dip in Oakite Special Protective Oil, an anti-rust material which imparts a thin, rust-preventive film to metal surfaces; and (10) machine.

This procedure proved to be the successful answer to the problem. Following the application of this method, the sleeves were checked after several days time and no sign of corrosion was visible.

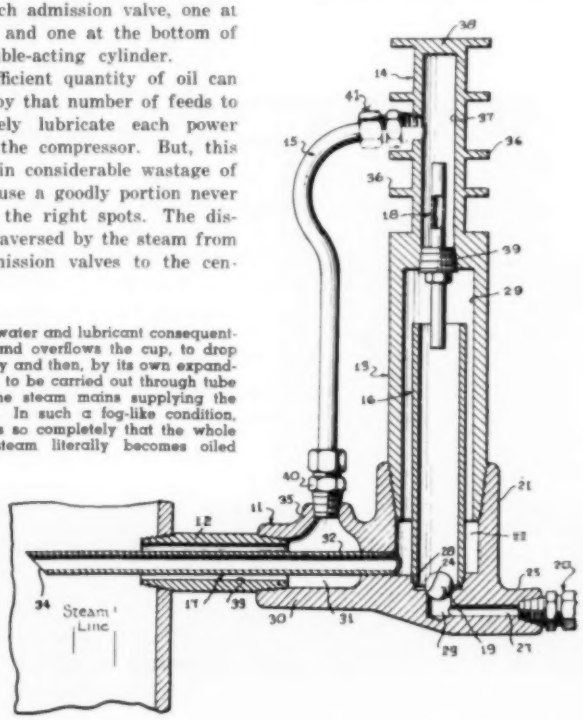
Case 61—Louisiana Chemical Plant

Complete Steam Lubrication from Less Oil

IN THE Sterlington, Louisiana, plant of Commercial Solvents Corp. there are seven Clark-Skinner compressor units rated at 2780 hp each. The eight power cylinders are of the unaflow type and were supplied to Clark Bros. Co. by the Skinner Engine Company. They are designed for steam conditions at the throttle of 265 psig, 600 F total temperature, and have a rated speed of 255 rpm. Each unit is equipped with a 19-feed mechanical force-feed lubricator for distribution of oil to the internal working surfaces of the eight cylinders. Sixteen of the feeds introduce oil into the steam near each admission valve, one at the top and one at the bottom of the double-acting cylinder.

A sufficient quantity of oil can be fed by that number of feeds to adequately lubricate each power end of the compressor. But, this results in considerable wastage of oil because a goodly portion never reaches the right spots. The distance traversed by the steam from the admission valves to the central exhaust ports is short and the ports offer an easy exit for the oil in its concentrated form to pass through the cylinders and out with the exhaust. Time is insufficient for the oil to atomize with the

(*Continued on page* 184)



The cross-sectional view shows internal construction of the Lube-O-Mizer in operative assembly on an engine's steam line, to which it is attached by nipple 12.

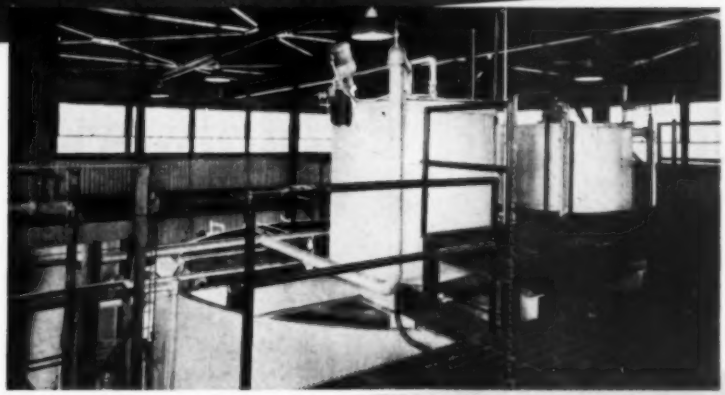
Drops of lubricant are fed intermittently by a force-feed lubricator (not shown) through connector check valve 20 into cup 16, which has an open top and is centered within housing 29.

Acting simultaneously, steam enters from the steam line through nipple 12 and tube 15 into heat exchanger 37, in which it is condensed to supply intermittent drops of water down through drip tube 18 and into cup 16 in which the lubricant accumulates.

At the same time, tube 17 provides a passage through which steam enters housing 29 to surround cup 16 with its attendant heat and create a state of turbulence or ebullition. Due to the time lag in the intermittently fed drops of oil, full ebullition and full expansion are reached. The mixture of bubbling and foaming water and lubricant consequently rises and overflows the cup, to drop by gravity and then, by its own expanding force, to be carried out through tube 17 into the steam mains supplying the cylinders. In such a fog-like condition, it mingles so completely that the whole of the steam literally becomes oiled steam.

Variable Raw Water Turbidity

UP TO 2000 PPM



Portion of installation of Graver Reactivator, 23 ft dia. x 13 ft high, at Plant Yates of Georgia Power Co. View from operating platform.

Consistent Clarified Water Turbidity

BELOW 10 PPM

at Plant Yates

GEORGIA POWER CO.

The turbidity of the Chattahoochee River at Plant Yates varies widely and is frequently as high as 2000 ppm. Also, the pH sometimes varies rapidly between 6 and 8.

But this combined clarification and stabilization problem presents no difficulties to the Graver Reactivator, which produces 400 gpm of clear water with a turbidity consistently below 10 ppm and with pH automatically controlled within specified limits through all the variations in the raw water supply.

Graver Reactivators are assuring similarly complete and dependable clarification for boiler feed, municipal water supply and industrial plants all over the country. Write for full information; and if you have a water conditioning problem of *any* kind, be sure to get Graver recommendations. Graver manufactures equipment for *every* water conditioning problem. Our modern designs are based on more than 40 years of specialized experience.

GRAVER WATER CONDITIONING CO.

Division of Graver Tank & Mfg. Co., Inc.

DEPT. SPI-R 216 WEST 14TH STREET, NEW YORK 11, N. Y.

IN CANADA: The Bird-Archer Co., Ltd.; Cobourg, Ontario
IN MEXICO: Proveedores Tecnicos, S.A.; Puebla 259, Mexico 7, D.F.

GRAVER *Reactivator*

ONE OF THE MANY GRAVER TYPES OF EQUIPMENT FOR EVERY WATER CONDITIONING PROCESS

GW 484

Section 8

Buildings and Equipment

Corrosion and insulation protection . . electrostatic precipitation . . outdoor grating . . reflective building insulation boosts heating capacity . . standardized structure design . . machine silencing equipment

Case 62—Texas Refinery

Hortonspheroids Insulated with Foamglas

RECENTLY completed at the Gulf Oil Refinery at Port Arthur, Texas, were four large Horton-spheroids, used to store butanes at about 50 F. Measuring 280 feet at the maximum outside circumference, the large tanks are constructed with walls of .35″-.56″ thick steel. To prevent corrosion and to properly insulate the spheroids, Gulf engineers and the Thermal Products Company of Houston, Texas, drew up carefully designed specifications for construction details. Zinc chromate, Foamglas, a fibrated asphalt cut-back and aluminum paint were basically the components of the covering.

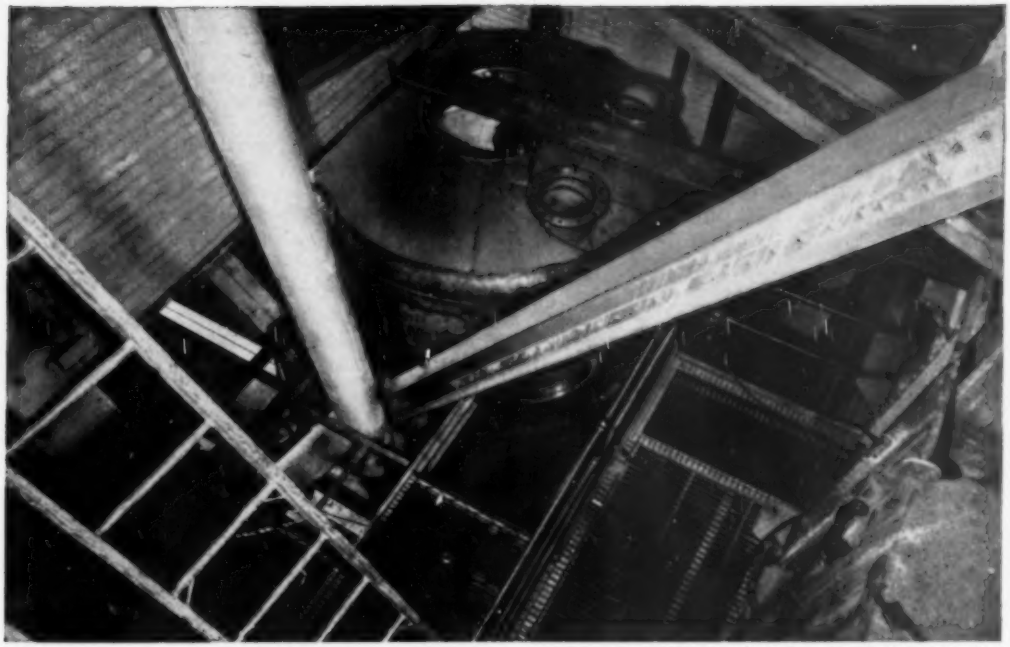
To provide a clean surface rough enough to make an excellent bond with a covering of zinc chromate, the spheroids were first sandblasted. The chromate was then sprayed over the vessel.

The next step was to set Nelson welding pins 9″ apart on horizontal circles drawn at 12″ intervals down the curvature of the spheroids. The pin arrangement was scheduled so that each 12″ wide by 18″ long block of Foamglas, when laid up with the long edge in a horizontal position, would be supported by two pins.

The chromated surface of the vessel was given a spray coat of vibrated asphalt cut-back ⅛″ thick when the pins were set in place.

Working from the top of the vessel down, the insulation crew impalled the rigid 2″ thick blocks of Foamglas on the pins. The Foamglas was set in place using a metal guide to insure that all joints would be tight, and was finally held in place with speed clips set over the pins.

Foamglas not only provides the insulating value required but also has an unusually high resistance



STAINLESS STEEL DEAERATING TANK is hoisted in place during construction of one of Detroit Edison Company's Heating Plants at Detroit, Michigan.

When CO_2 Caused a Headache ...Worthington Cured It

Detroit Edison had the solution to its problem —the problem of CO_2 in its steam—except for one thing.

Zeolite-softened municipal water used in their steam plant contains high percentages of carbonates which decompose and generate CO_2 in the boilers. Carried over with the steam into heating and processing equipment, that CO_2 could cause plenty of trouble.

The CO_2 problem was solved by Detroit Edison engineers by acid treating the softened water, converting the carbonates to CO_2. The gas thus formed is driven off in a deaerator.

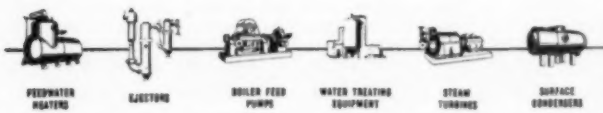
However, no standard deaerator could successfully remove the large quantities of CO_2 released by the acid treatment, and deliver water to the boiler with practically zero oxygen and zero CO_2. Furthermore, standard materials would have lasted only a few months under such conditions.

NON-CONTAMINATED STEAM

Worthington provided the answer. Detroit Edison engineers selected a Worthington deaerator specially designed for these severe conditions, built entirely of stainless steel, and guaranteed to deliver water containing not over 0.005 ppm of oxygen and not over 0.1 ppm of CO_2. The result is steam containing so little CO_2 that the amount *cannot be accurately measured!*

On problems like this one, Worthington not only furnishes *all* of the equipment needed in a complete water treating installation, but also has the engineering ability to work with your engineers on the *complete* problem of generating steam for power or processing. For further information on why *there's more worth in Worthington*, address Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Steam Power Division, Harrison, New Jersey.

S.I.2



A GREAT TEAM IN STEAM

WORTHINGTON

Feedwater Heaters

to moisture, being composed of millions of tiny glass bubbles fused together to form a continuous structure.

The application of insulation covering the entire perimeter of the spheroids at the base where the supports were strip-sheeted with 12 gauge metal was of special interest. The sheets of metal left two 16" wide open areas around the base of the spheroids. The Foamglas was applied in the same manner here as was followed on the vessel. However, it spanned the open areas without additional support.

To further protect against corrosion, the joints and speed clips were carefully pointed with a coat of fibrated asphalt cut-back. Following this, a coat of fibrated asphalt cut-back ⅛" thick was sprayed over the entire area, giving special attention to good coverage where piping and supports occurred. The final step was to give the spheroid a spray coating of aluminum paint as a weathering agent.

Case 63—Georgia Paper Mill

Cottrells at Union Bag and Paper Corporation

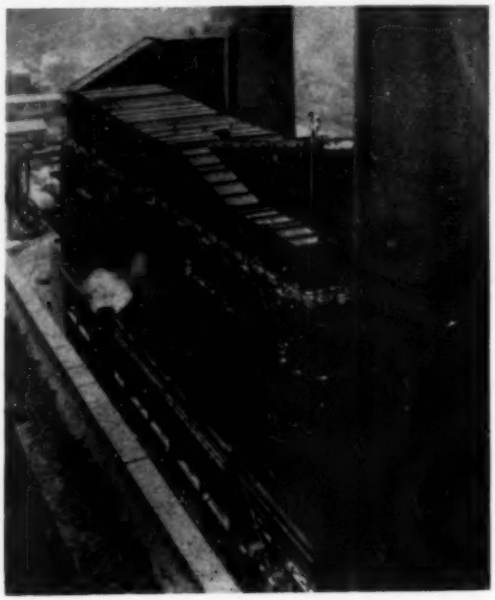
COTTRELL electrostatic precipitation has become well known throughout the South and Southwest in a variety of applications, including the paper, oil, carbon black, metallurgical, steel, and power industries.

An example is the Union Bag and Paper Corporation, Savannah, Georgia, where seven Research Corporation precipitators, including the latest one expected to be completed in October, 1952, will handle on full load 875,000 cfm of gases at about 275 to 325 degrees F with an efficiency of 90%. The precipitators are used to recover sulphate particles from gases coming from eleven recovery furnaces treating black liquor for the recovery of sodium sulphate in kraft pulp production.

In the Cottrell process employed, a high voltage unidirectional current flow is set up between two sets of electrodes—the high tension, wire discharge electrodes, and the rod-curtain type collecting electrodes. The gases from the recovery furnace enter the top of the precipitator, move down inside the shell, and up again through the electrostatic field made by the electrodes, where the gases are cleaned before leaving the precipitator through the stack.

A 60 to 75 kv negative charge from the discharge electrodes forms ions which are attached to the sulphate particles in the gas when the gas is in the electrostatic field. In this way the particles become negatively charged and are attracted to the positively-charged rod-curtain electrodes, where they are neutralized. Some of this neutralized sulphate immediately falls into the hopper or Wet Bottom provided for this purpose, but most of it tends to build up on the collecting electrodes and is removed with rappers which periodically strike the collectors, causing the dust to be shaken off and dropped by gravity.

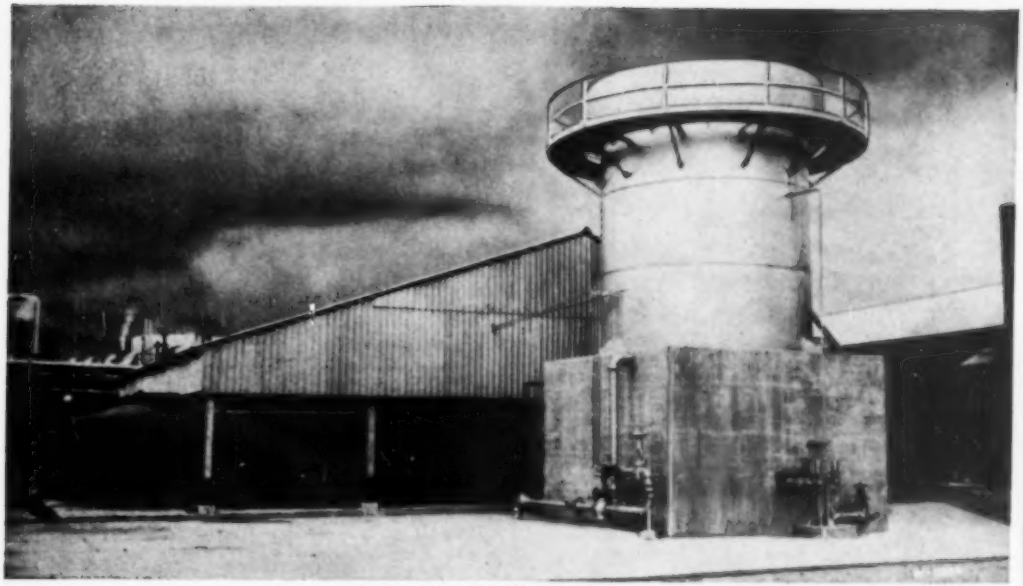
Every Cottrell installation includes a tile-shelled precipitator and the electrical equipment needed to step up the regular plant power to the high voltage unidirectional current necessary for precipitation. Built for severe service lasting over many years, the Cottrell is designed to alloy even gas distribution for the best collection results. Electrical equipment for all the precipitators here, including rectifiers, transformers and control panels, are located in a substation.



The five precipitators illustrated clean gases from nine furnaces treating, in all, 3,240,000 pounds of black liquor solids daily at peak load. Two more, one completed in January, 1950, and the latest one, are intended for two spray type recovery furnaces treating together over 2,000,000 pounds of black liquor solids daily.

The latest precipitator includes the new Wet Bottom feature, enabling continuous, immediate recovery of the sulphate particles into the black liquor through use of a liquor tank located below the electrodes which is actually the bottom of the precipitator chamber and enclosed within the shell.

Black liquor from the multiple effect evaporators is piped into the Wet Bottom either directly or through a storage tank. The level of the black liquor is controlled while it passes through the Wet Bottom, and it receives dust either dropping or rapped off the collecting electrodes. The liquor holds these sulphate particles in solution or suspension by means of a motor-driven rotary agitator, and it is then pumped out to the cascade evaporators.



SPECIALLY DESIGNED 500 GPM WORTHINGTON TREATING SYSTEM at the new Pemex natural gas refinery in Poza Rica, Mexico. System includes cold-process slurry-type softener followed by acid feed, filtration and zeolite treatment. Engineered by Arthur G. McKee Company.

Specially Designed for Intermittent Service

Softening system for boiler feed water built for short-period operation, long shutdowns

Water conditioning requirements are especially tough at the new Pemex natural gas refinery in Poza Rica, Mexico.

Their need for variable-rate, continuous-service softener operation is complicated by the intermittent boiler feed-water storage demands.

Pemex's conditioning requirements have been met by a specially built Worthington system, so designed that the slurry bed is not lost during "off-service" periods. The bed resumes its normal suspended position at the instant service is resumed. This avoids the irregular treatment, delay and water waste common in systems that require creation of a new slurry bed after each shutdown period.

New Bulletin W-212-B5 gives you the vital facts about this unique cold process water softening method. Write for your free copy today.

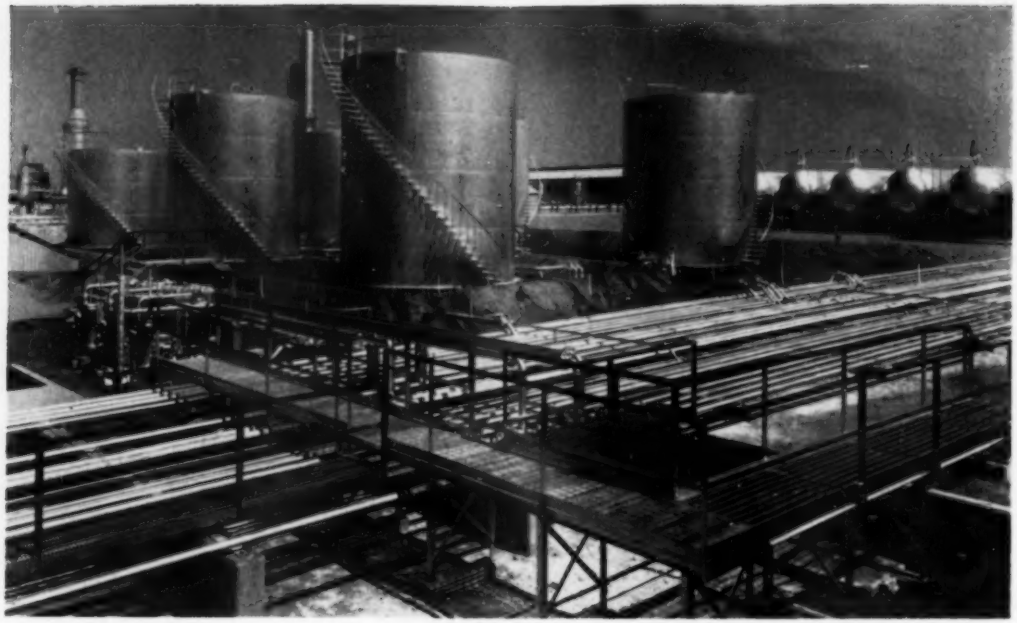
Worthington engineers and builds equipment for all the major types of water-conditioning systems, therefore is in an excellent position to give comprehensive and well-balanced recommendations on your water-conditioning equipment problems . . . further proof that *there's more worth in Worthington*. Worthington Corporation, Water Treating Section, Harrison, N. J.

A1.3

Worthington Makes More of the Equipment for ALL Types of Water Conditioning Systems

WORTHINGTON

Water Conditioning



Case 64—Texas

Photo by Jack F. Laws, Corpus Christi, Tex.

Grating by the Mile in Cycling Plant

GRATING was an important item in the design of the Texas cycling plant pictured above. In addition to the usual functional purposes, outdoor grating must resist corrosion. The Weldforged steel grating furnished by Kerrigan Iron Works for this job has high strength, and longer life due to its Bonderized treatment which assures corrosion control and provides positive paint adhesion. The grating also sheds dust, and lets through maximum light and air. Because of its continuous spiral transverse bars that rise slightly above the bearing bars (and alternate right and left), it provides excellent safety under foot.

The grating employed here is also simple to install and facilitates provision of openings for columns, pipes, etc.

Case 65—North Carolina

Reflective Insulation Boosts Heating Capacity

IN the summer of 1951, Craftique, Inc., finished a new 60 x 100 foot addition to their Mebane, N. C. plant. How to heat it was the problem. Past experience indicated that it couldn't be done with the capacity of the existing steam plant.

Several industrial heating engineers, called in for consultation, recommended that an automatic stoker be installed. Price quotations ranged from $8,000 to $10,000, installed.

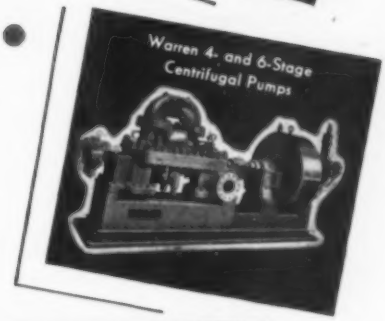
Seeking an alternative to this high cost, President L. P. Best of Craftique thought of insulation. And having seen "Alfol" reflective insulation, a product of Reflectal Corp., applied at another Mebane plant, he called in Nicholson, Inc. of Durham, the firm that had handled the previous installation.

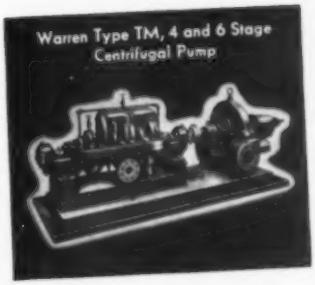
The Nicholson people calculated that if the ceiling of one 17,000 square foot wing of the building were insulated, the heat load on the old coal-fired steam plant would be sufficiently reduced to permit the heating of the new 6,000 foot addition.

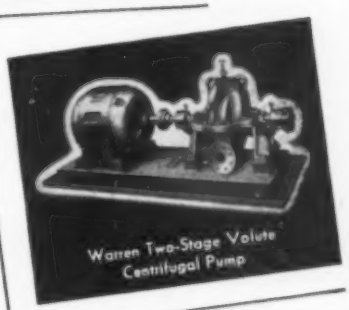
The Alfol Type IV insulation used here consists of 3 layers of aluminum foil, 2 of which "pop up" on application to suspend themselves in the air space between the ceiling joists. The bottom foil layer is laminated to a heavy waterproof backing that adds extra application support, and prevents ripping or sagging.

An extremely low applied cost is made possible by the modest cost of the material itself and, even more important, by the unusual ease with which the lightweight Alfol blanket is applied. It is stapled right across the faces of the

a boiler plant is no more dependable than its Feed pumps....







For well over half a century Warren has specialized in this field and has kept pace with boiler feed requirements as they have developed over the years.

As builders of both Centrifugal and Reciprocating types and for light, medium and higher pressure services, there is a thoroughly dependable Warren Pump to meet a very large part of all boiler feed conditions. Their on-the-job record has long been one of reliable, low cost operation.

P-28

Time-Tested Experience Indicates it is Good Business

to Specify **WARREN PUMPS**

WARREN / QUIMBY PUMPS

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS

Centrifugal . . . . . Reciprocating . . . . . Rotary

joists or furring strips and is completely self-supporting.

The 17,000 square foot wing of the Craftique plant was insulated with Alfol Type IV at a total applied cost, (labor and 17,000 square feet of material) of $2,600, less than 16c per square foot.

Results

1. The existing steam plant was more than able to heat the new 6,000-foot addition — without the $8,000-$10,000 expense of a new automatic stoker!

2. Total comparative fuel costs were actually *reduced*—in spite of the 6,000 square foot increase in area heated. Company records reveal that the 1950-51 coal bill (before the addition and before insulation) was $2,324.35. Increased production, increased use of dry kiln and paint dryer, indicated a 1951-52 coal bill — *without* the 6,000 foot increase in heating area — of $2,440.57. The actual 1951-52 coal bill — *including* that required to heat the 6,000 foot addition — was $2,363.04. After insulation of only one wing of the building, 6,000 square feet *extra* was heated for $77.53 *less*.

3. In the summer of 1952 increased comfort (temperature reductions of 10 to 15 degrees in the insulated wing) was reported by Craftique personnel.

4. Increased illumination, improved appearance in the insulated wing.

5. Reduced maintenance costs in the insulated wing — an "Alfol" ceiling requires no painting, no cleaning, and will last virtually the lifetime of the building into which it is installed.

Section of roof insulated with *Alfol*. Inset shows the method of installation.

Case 66—South Carolina

Standardized Structure Design Permits Speedy Erection of Production Facilities

THE expanding Lock Joint Pipe Company, manufacturer of reinforced concrete pipe, sewers, drains and water lines, needed a new plant at Columbia, S. C., for the manufacture of prestressed concrete pressure pipe.

It called in the Luria Engineering Corporation, which specializes in the design and construction of standardized steel industrial buildings, and specified seven new structures for its new plant site, about five miles from the center of Columbia.

Because of standardization, enabling Luria to maintain a large inventory of building components at its fabricating plant in Bethlehem, Pa., Lock Joint was able to get its plant up with a maximum of speed.

And it got the speed without sac-

Largest of seven Lock Joint Pipe Co. standardized buildings at Columbia, S. C., produced by *Luria Engineering Corp.* Building, including long lean-to, has floor area of 19,000 sq ft and is equipped for two 15 ton overhead cranes at rail height of 38 ft. Open craneway extends 120 ft on one side and 100 ft on the other.

The COEN COMPANY BACKGROUND in the Industrial PACKAGED BURNER Field

YEARS OF EXPERIENCE AND KNOW-HOW!

★ **40 years...** Forty years experience in designing and applying Gas and Oil Burners to Power Boilers.

BURNER EXPERIENCE

★ **40 years...** Forty years experience in designing and manufacturing Fuel Oil Heaters and Duplex Strainers and in the "engineered" fabrication of complete Fuel Oil Pump, Heater and Strainer Sets.

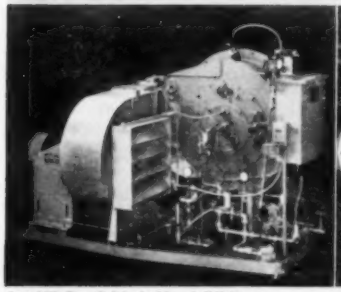
EXPERIENCE WITH FUEL OIL "HANDLING" EQUIPMENT

★ **15 years...** Fifteen years experience in designing, manufacturing and putting into service in the field, simplified combustion control systems for boilers up to 80,000 pph.

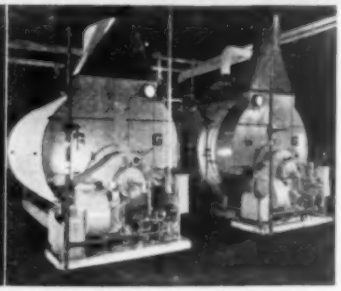
EXPERIENCE WITH AUTOMATIC COMBUSTION CONTROL SYSTEMS

With this substantial background and the all important experience and know-how it represents, you may rely on Coen Company for the sound selection and practical combination of as many as 50 specialized components which enter into the modern, efficient...

PAC-O-MATIC OIL & GAS BURNERS



500 HP Pac-O-Matic No. 6 Oil Burner Fully Automatic—Modulating.



225 HP Pac-O-Matic Burners for Gas and Oil. Single pump set for both on left unit.

No more Equipment Selection Headaches with a single unit

Coen PAC-O-MATIC OIL & GAS BURNER

...and less headaches getting your equipment installed and into service—no weeks of living with a "torn up" boiler room—piping and wiring to service connections only required.

Write today for Bulletins giving complete information and illustrations

COEN COMPANY

COMBUSTION ENGINEERS • DESIGNERS • MANUFACTURERS

COEN

OIL AND GAS BURNER EQUIPMENT FOR INDUSTRY

MAIN OFFICE AND PLANT: 40 BOARDMAN PLACE, SAN FRANCISCO 3

Eastern Agents and Warehouse—Coen Burner Sales Co., P.O. Box 7, Union City, New Jersey

Write for address of representative nearest you

rifice of quality, individuality or permanence. These standardized structures are fabricated from heavy, rolled-steel members and are designed to meet the most exacting building codes.

The individuality of custom-designed plants was attained because Lock Joint was able to make its specifications to suit its own needs —drawing upon a wide range of standard sizes and types that could be combined into any arrangement and upon a practically unlimited choice of collateral materials and door and window locations.

Luria's streamlined methods of production and construction slashed costs all along the line, from the drawing board to erection and maintenance. The blueprint stage was obviously lower in cost than traditional designing because so many of the elements were standardized.

Economy in erection was achieved because all the elements required for construction were shipped to the site, including a set of erection instructions, bolts, nuts and screws. All field connections were designed for bolting, so there was no need for welding or riveting on location.

The Lock Joint plant covers 1,341,648 sq ft, or more than 30 acres. The largest building, with a floor area of 7,000 sq ft and a long lean-to covering 12,000 sq ft, is employed for cranes. It houses machinery, a batching plant, boiler room, wash house and storage facilities.

The second largest building, covering 14,000 sq ft, is a shop for steel cylinder fabrication. The third building is used for wrapping prestressed wire on concrete cores, while the fourth is employed as a laboratory and for cement storage.

The fifth and sixth buildings are for special pipe manufacture and for wire storage. One is equipped for a three-ton crane and the other for a one-ton crane. The seventh building is for storage of stocks, materials and tools.

Case 67—Virginia Chemical Plant

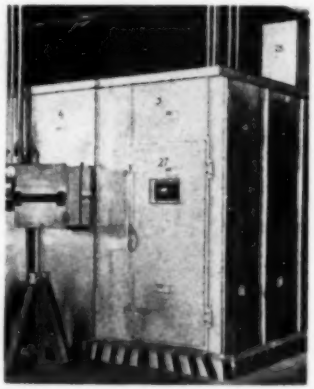
Cutting Machine Silencing Equipment

HIGH noise levels cause fatigue, resulting in inefficiency and may also be responsible for accidents due to inability of operating personnel to correctly understand verbal instructions.

A recent interesting application of noise control techniques at a Virginia chemical plant was engineered by the Industrial Acoustics Company, Inc. Plant management wanted to protect their operating personnel against the objectionable noise created by a number of cutting machines, and at the same time, secure quiet conditions for their maintenance staff engaged in servicing these machines. The problem was to design silencing equipment which would not interfere with production efficiency in any way. This problem was solved by designing Special I.A.C. Product Feeding Silencers and Product Removal Silencers. These were incorporated in a silencing enclosure constructed of I.A.C. Standard Acoustic Panels which consist of sound-absorbing material inside a sheet metal envelope which is perforated on one side.

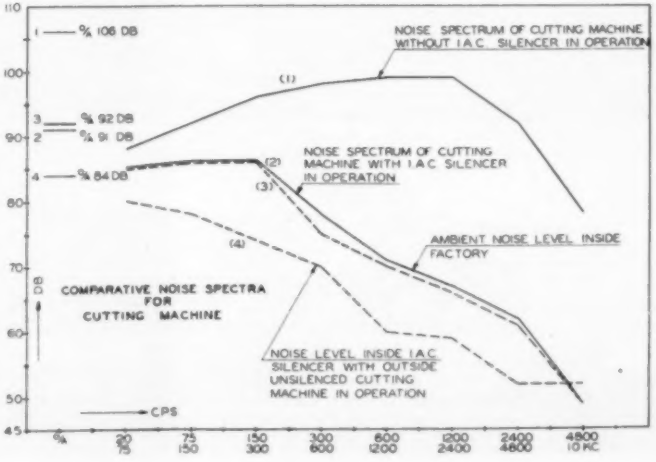
Before and after results are shown on the chart. Curve No. 1 shows the noise spectrum of one cutting machine with an overall noise level of 106 db before in-

(*Continued on page* 195)



Partial front view of silencing installation, made by the *Industrial Acoustics Company, Inc.* Rectangular unit projecting in front is the Product Feeding Silencer designed on the principle of an acoustic filter. Unit projecting from the roof is an Air Intake Silencer for ventilation and air supply. Soundproof door has an inspection window.

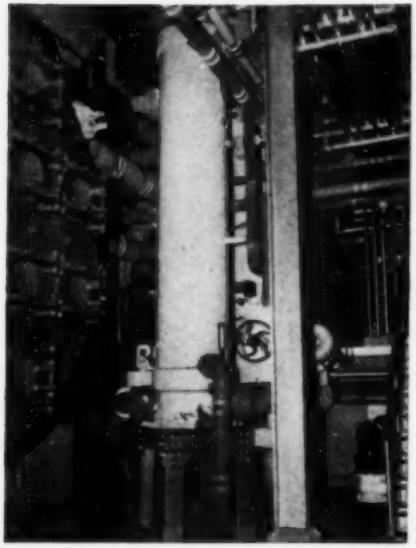
Comparative noise spectra showing typical "before" and "after" results of cutting machine silencing installation.



Note: DB (decibel) is a ratio and does not have any dimensions. It compares two sound pressures.

CONSECO Contributes...

to PUERTO RICAN ECONOMIC PROGRESS



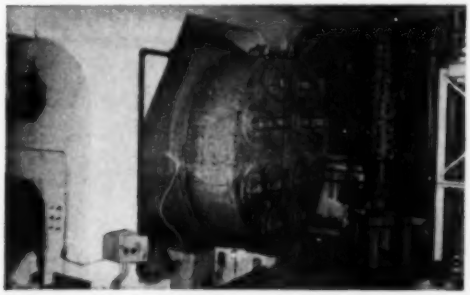
Intermediate and High Pressure Feed Water Heater for Unit No. 1. Both heaters operate with 1200 psig in water passages and have integral de-superheating and drain cooling sections.

WHEN the new San Juan Steam Plant is completed, CONSECO will have furnished the following equipment:

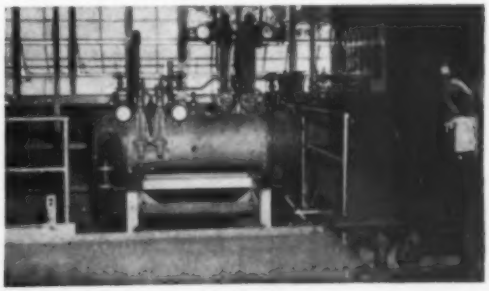
- 2 20,000 sq. ft. CONSECO two-pass divided flow Condensers for Units Nos. 3 and 4.
- 2 twin element two-stage CONSECO Steam Jet Air Ejectors for Units Nos. 3 and 4.
- 4 834 sq. ft. CONSECO high pressure Heaters. Forged steel heads are of the shear ring design with integral tube sheets. For Units, 1, 2, 3 and 4.
- 4 834 sq. ft. CONSECO intermediate pressure Heaters. Forged steel heads are of the shear ring design with integral tube sheets. For Units 1, 2, 3 and 4.
- 2 single stage non-condensing hogging Ejectors for Units Nos. 3 and 4.

As of this time, Units Nos. 1 and 2 are in operation. Unit No. 3 will be on the line soon. Unit No. 4 presently being fabricated.

Selections of CONSECO equipment for this new power plant is evidence of recognition of CONSECO'S competent engineering as well as responsibility for meeting performance guarantees. Every day dependable service of CONSECO equipment in hundreds of plants is a matter of record. Send for illustrated Engineering bulletins covering CONSECO Condensers, Feed Water Heaters, Evaporators, Deaerators, Boilers, Steam Jet Air Ejectors and Refiner Filters.



CONSECO Condenser installed ready for final painting and Feed Water Heaters ready for application of insulation. Unit No. 3.



One of the two Twin Element CONSECO Air Ejectors in this new Puerto Rican power station serving a 20,000 sq. ft. CONSECO Condenser. Each unit is complete with pressure reducing valve, socket-welded steam piping and CONSECO thru-type Air Meter. It is one of the largest power plant type ejectors to be equipped with combined inter and after condensers. Air Ejector shown serves Unit No. 3.

CONSECO Condenser Service & Engineering Co.
HOBOKEN, N. J.

Section 9
Production Equipment

Infrared for drying and baking . . deionized replaces distilled water . . welding aids . . non-electric magnets . . handling anhydrous ammonia . . airless blasting . . proportioning bulk materials by weight.

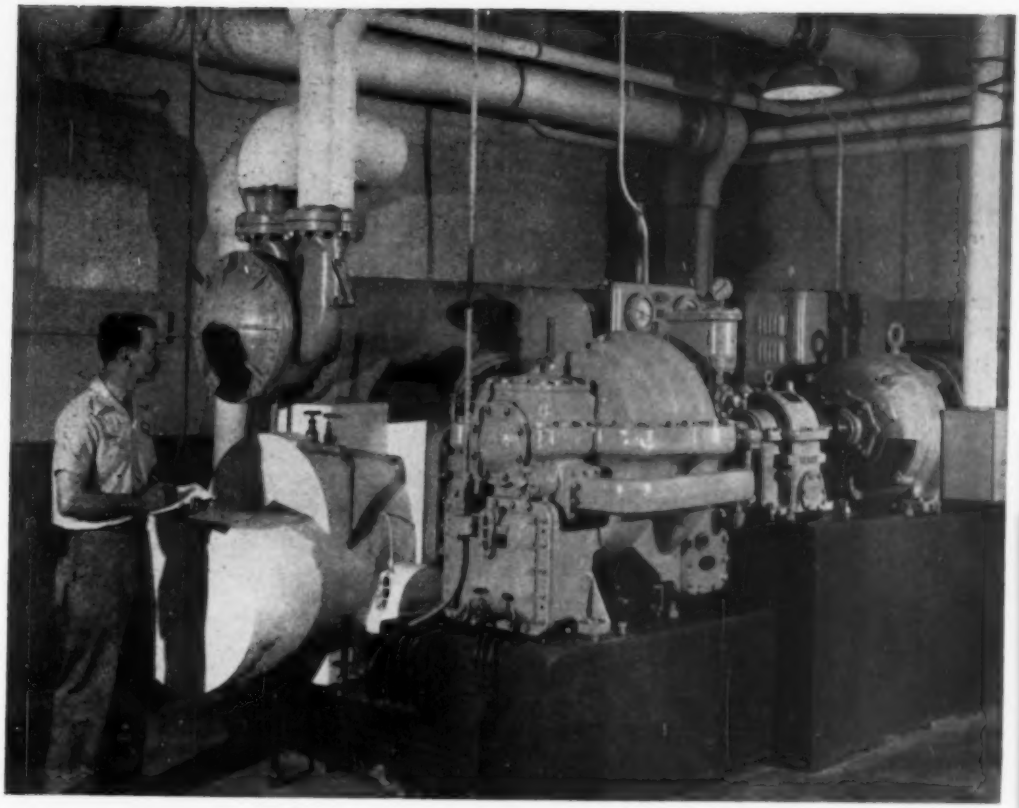
Case 68—West Virginia

Mold Drying Time Reduced Two-Thirds

PORCELAIN Products, Inc., Parkersburg, W. Va., uses a gas fired, counterflow, 1,000,000 Btu heater supplied by Dravo Corporation to supply high velocity heated air to two driers.

In forming electrical porcelain insulators by the "hot press" method, heated air is used to shrink the clay casting inside the mold so it can be released from the mold and handled in production operations that follow, without distortion.

This specially designed mold release drier permits quicker and more carefully controlled drying of molds and porcelain parts at Porcelain Products, Inc., Parkersburg, W. Va. The Dravo heater, left, maintains uniform temperature of air which is discharged at high velocity inside the drier. The same heater supplies air for two driers.

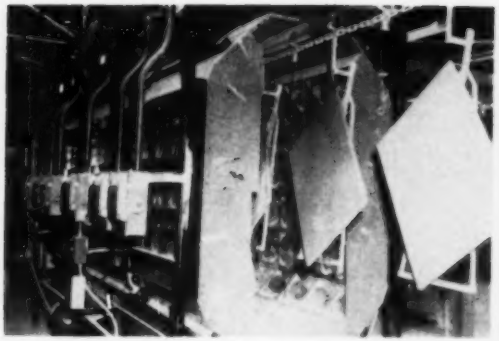


You Can't Tell

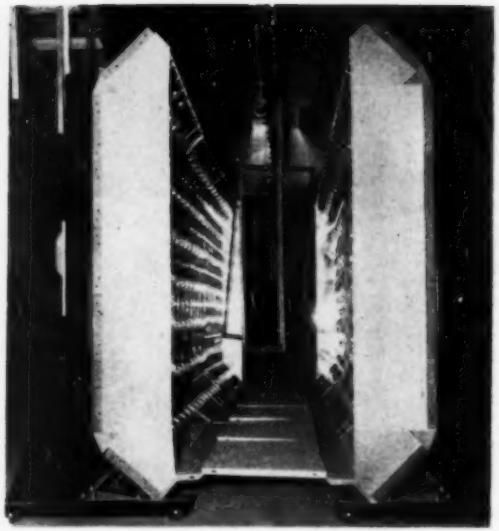
YOU CAN'T DETERMINE efficiency by sound alone. Just because the wheels of your machinery are humming does not necessarily mean that down time caused by faulty lubrication is being held to a minimum. The problem of lubrication becomes more important and more difficult with the ever increasing complexity of modern industrial equipment operating at higher speeds with closer and closer tolerances, higher loads, and under varying operating conditions. To be sure of having the proper lubricants to fill your specific needs, call an experienced Standard Oil lubricating engineer. His knowledge, gained through constant contact with the power industry, is backed by the world's largest combined facilities for the research, testing and engineering of petroleum products. It will be well worth your while to call him today.

Standard Oil Company
(KENTUCKY)

STANDARD OIL
LUBRICANTS



Infrared oven, Athens Stove Works.



Infrared oven, Pneumafil Corp.

Case 69—Southeastern Metalworking Plants

Infrared at Work in Southern Plants

By Paul H. Krupp
The Fostoria Pressed Steel Corp.

SOUTHERN manufacturers contemplating modernization and adoption of baking facilities will want to know more about what infrared is actually doing for other plants in the South. The accompanying brief histories and photographs will help to depict the situation. While these examples pertain to metal finishing operations there are many other uses for infrared including various types of drying and dehydrating.

Pneumafil Corp., Charlotte, N. C., uses Infrared for baking paint on a device that is designed to improve the preparation of yarns. When the device is completely assembled, with motor, in its cabinet enclosure, it is sprayed with synthetic enamel. It is then that it is conveyed through the 22 ft oven. Internal parts for the device are also sprayed and baked prior to assembling. The parts are baked for approximately 6 minutes, while the completely assembled unit requires approximately 15 minutes.

The entire finishing system for the manufacture of the device requires a spray booth, a conveyor and the 22 ft infrared oven. The oven is equipped with controls, permitting it to be operated at reduced intensity, for certain baking operations. Temperatures of approximately 300 F are reached on the surface of the device including a variety of metal gauges from 26 to 16.

Atlanta Stove Works, Atlanta, Ga., has expanded its line of products to include radiant gas heaters, lawn furniture and gliders, cast iron chairs and benches. All of these items get various finishes baked in a 22 ft. infrared oven. Most of the above items get one coat of sprayed synthetic enamel and baking in the oven for 8 minutes. The cast iron items get one coat of red oxide primer and 5 minute bake, followed by one coat of finish white, baked for 12 minutes.

American Coolair Corp., Jacksonville, Florida, is using a 22 ft Infrared oven to turn out its regular line of attic and window fans, in addition to a large contract awarded them by the government for fans. This installation is completely conveyorized and uses spray equipment for applying the ivory and gray colors. Baking time is 8-10 minutes, depending upon the particular parts being processed.

Athens Stove Works, Athens, Tenn., operates two infrared ovens as the most efficient and fastest method of drying slip enamel on various parts.

The accompanying photograph shows the vertical oven used for ground coat. A separate horizontal oven is used for the cover-coat. Ground coat enamel is applied by both dipping and hand spraying. The cover coat line utilizes automatic spraying in addition to hand spraying. The remarkable thing about the drying of the ground coat and cover coat is that with infrared it is accomplished in less than a minute. After drying in the infrared ovens the product moves on into high temperature furnaces, used for fusing the coating to the steel.

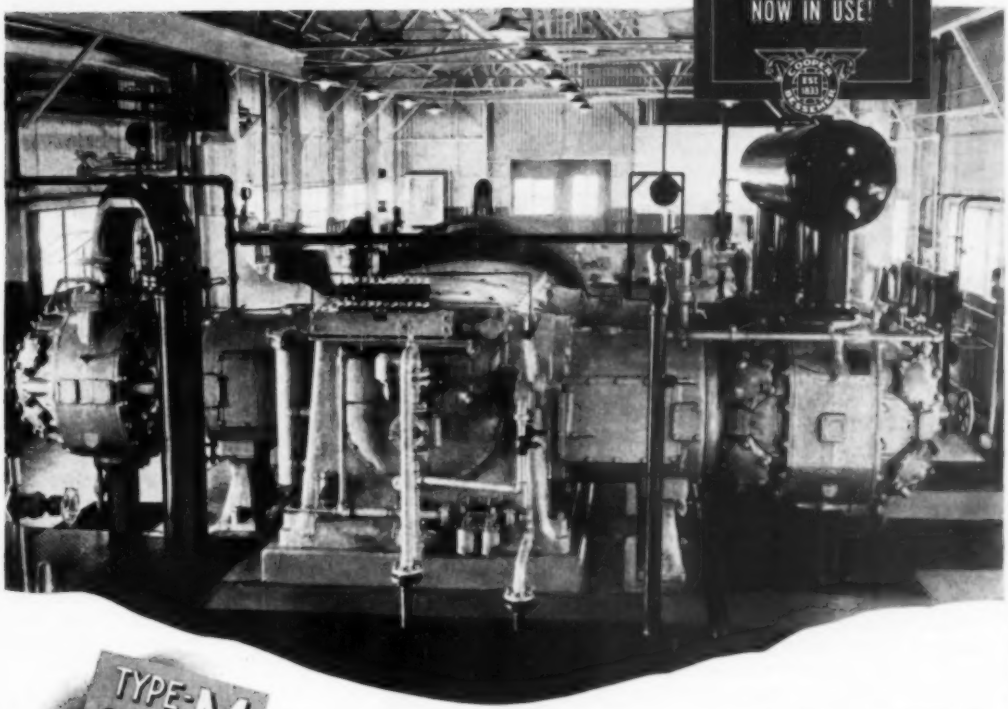
Carolina Metal Products Co., Charlotte, N. C., is another progressive Southern manufacturer that has adopted the Infrared process for paint baking. The principal product manufactured by this company is a line of automotive oil filters. Other items produced by them are metal folding chairs, and metal parts are sprayed and baked; then the wood parts are installed. Colors used for the furniture are cream and ivory. Baking cycle on all items is 5 minutes. This company uses a completely modern conveyorized system.

Many other companies in the South are modernizing their plants to include Fostoria infrared for baking, drying, etc. **Atlantic Metallic Casket Co.**, Villa Rica, Georgia uses a number of Infrared ovens for baking prime and finish coats on caskets and burial vaults. **Noland Tank and Galvanizing Co.**, Nashville, Tenn., uses infrared ovens for baking white synthetic enamel on electric water heaters and radiant heaters. **Hackney Bros.**, Wilson, N. C., employs two large 29 ft ovens for baking finish on truck and bus bodies.

Cooper-Bessemer Compressors

Thousands speak louder than words!

Over 6 million Cooper-Bessemer Compressor Horsepower NOW IN USE!



Send for your copy of this new bulletin covering the features, capacities, dimensions, weight, etc. of the Cooper-Bessemer power-driven Type M compressors. 200 to 1,000 hp. Other bulletins covering still larger sizes are also yours for the asking.

COOPER-BESSEMER Compressors of the most modern types, such as the space-saving unit shown above, today total millions of horsepower. You'll find these efficient compressors in all kinds of service.

Get all the facts on the latest Cooper-Bessemers. They are built for any type drive in sizes up to 5,000 horsepower, are backed by years of compressor-building experience.

The **Cooper-Bessemer** *Corporation*

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

Case 70—Tennessee

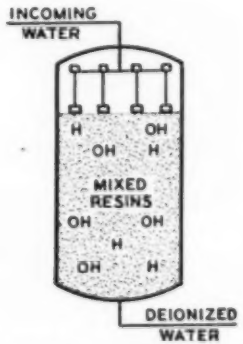
Deionized Replaces Distilled Water

A PROCESSING PLANT faced with mounting production costs sought ways of cutting expenses without sacrificing product quality. An item of considerable expense was the high cost of producing distilled water used in the manufacture of their product.

Improved ion-exchange techniques in the field of water conditioning whereby water equivalent to high quality distilled water could be produced were investigated. A thorough study of the trend in many industries to changing over from the use of distilled water to deionized water, resulted in the installation of a mixed-bed deionizer of single tank design. The deionized water delivered by this equipment has proved equal to the best quality distilled water formerly used. The high quality of their product remains unchanged.

How It Works

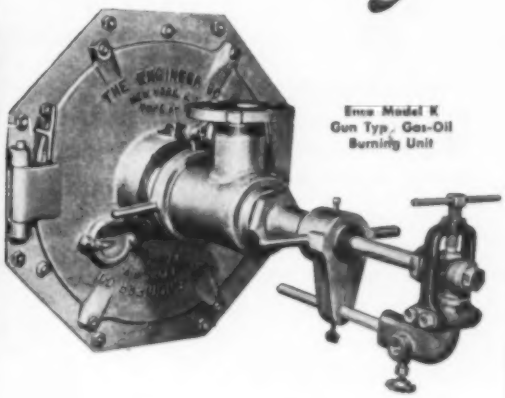
A product of the Elgin Softener Corporation, the equipment used is called an Ultra-DeIonizer. It is quite simple in operation. As illustrated, the cation (H) resin exchange material and the anion (OH) resin exchange material are included in the same tank. During the service run, the two resins are intimately mixed. This mixed bed, in effect, is a "multi-multiple-bed



Installation of a mixed-bed deionizer of single tank design resulted in savings of more than $4 per thousand gallons of water produced—approximately 5% of the cost of distilled water.

flexible... 3 ways

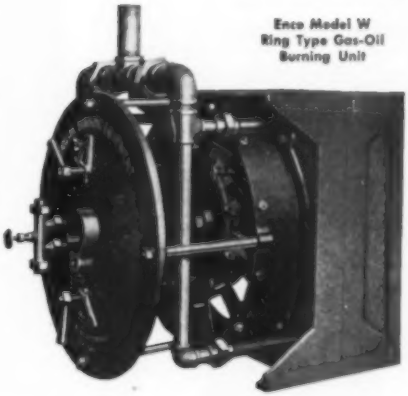
ENCO
OIL AND GAS BURNER UNITS



Enco Model K
Gun Type, Gas-Oil
Burning Unit

These specially designed oil and gas burner units fit your needs . . . even when your operating conditions keep changing. Enco Oil and Gas Burner Units offer money-saving flexibility on three important counts. (1) They are designed for use with either oil or gas — or both . (2) They assure completely uniform combustion and greater fuel economy though steam demands swing sharply. (3) They can be operated by either natural or forced draft.

Even if your old combustion equipment "works", it pays to investigate the fuel-saving economies and full flexibility of these highly efficient units. Enco Burner Units are made in many sizes to suit all capacity requirements. Bulletin on request.



Enco Model W
Ring Type Gas-Oil
Burning Unit

ENCO
INTERCHANGEABLE ATOMIZERS
FOR USE WITH ALL TYPES OF BURNER EQUIPMENT

Wide Range Mechanical—Manual or automatic control. Constant high oil pressure at atomizer insures efficient atomization over entire load range without recirculating or returning oil.

Steam or Air—Wide range. Controlled by manual or automatic pressure regulation.

Standard Range Mechanical — Available in all sizes to suit load and capacity requirements.

Enco Standard Range Mechanical Atomizer Gun

Enco Wide Range Steam Atomizer Gun

Enco Wide Range Mechanical Atomizer Gun

Enco Standard Atomizer Gun Support

Enco Gas Burning Gun

EC-482

THE ENGINEER COMPANY
75 WEST STREET, NEW YORK 6, N. Y.

deionizer" consisting of countless cation and anion beds acting in unison within a single tank. As water passes down or filters through the unit the cation exchange resin removes all positively changed ions (calcium, magnesium, iron, sodium, potassium, etc.) and substitutes hydrogen (H) ions in their place. The anion exchanger which is a strongly basic resin removes all negatively charged ions (sulfates, chlorides, nitrates, carbonates, carbon dioxide, silica, etc.) and substitutes hydroxyl (OH) ions in their place. The hydrogen (H) ions and the hydroxyl (OH) ions combine to form water (H_2O). Thus all the mineral impurities including silica and carbon dioxide are eliminated to give deionized water of highest known chemical purity.

The system operates under pressure, so there is no repumping expense. No heat is required; no costly shut-downs for cleaning; and very little space is needed.

Case 71—Alabama

Grinder Replaces Chipping

THE problem arose in a large steel foundry in Alabama to reduce the time required for finishing heavy flame welds.

The normal procedure was to

By any Yardstick...

FAIRBANKS-MORSE
MEASURES UP TO YOUR NEEDS

How do you measure large centrifugal pumps for your water works needs?

By Dependability?
Fairbanks-Morse scores top ratings here. Rugged design and construction . . . careful testing . . . years of successful application make Fairbanks-Morse Centrifugal Pumps a preferred choice for dependability.

By Ease of Servicing and Maintenance?
Fairbanks-Morse Pumps are noted for their minimum maintenance requirements. And, when servicing is needed, Fairbanks-Morse accessibility makes it fast and easy. For example, the entire rotating impeller element can be removed without disturbing driver, suction or discharge piping.

By Performance?
Here, again, Fairbanks-Morse Pumps lead the field. They develop the highest possible efficiency over a wide range of performance. It's common practice for a Fairbanks-Morse Pump to exceed its efficiency guarantees.

For dependable performance for your water works, check Fairbanks-Morse Double Suction Single Stage Centrifugal Pumps. Capacities to 50,000 GPM . . . heads to 300 feet. For information, see your Fairbanks-Morse Branch Pump Engineer or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering when you want the best

PUMPS • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • SCALES • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS

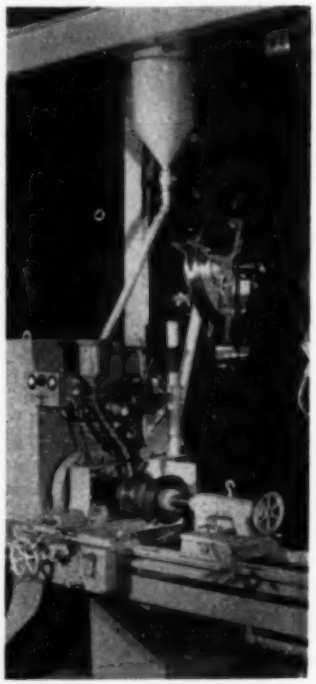
chip and then grind. This usually required 1½ to 2 hours for the combined operation.

The Cleco Model 5055-RA Heavy-Duty Grinder, a new tool just being offered to the market, was applied to the job. The chipping operation was eliminated and the entire job was done by grinding in 15 minutes, reducing the overall time by a matter of 1¼ hours for the one job.

Case 72—Alabama

Tractor Roll Welding

TRACTOR rolls are built up easily and economically on a welding machine built from a lathe and standard Unionmelt welding equipment by the J. D. Pittman Tractor Company of Birmingham, Alabama. Worn rolls are rotated beneath the Unionmelt welding head mounted on the movable saddle. Weld metal is evenly applied,



A small-size tractor roll being built up by *Unionmelt* welding. An extension of the line center permits handling of larger rolls directly over the trough at right.

it's 10 years for Copes at Montaup

ON AMERICA'S FIRST 1935 PSI, 960 F CONTROLLED CIRCULATION BOILER

boiler water level control

master excess pressure control • recirculation on light load . . .

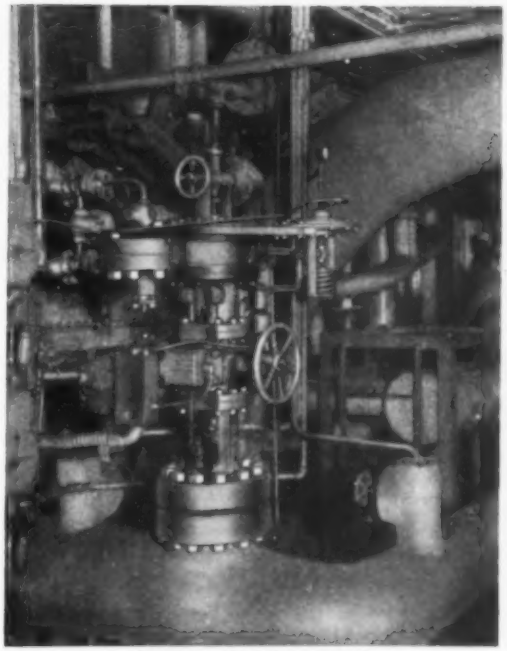
Ten years ago—in October, 1942—America's first large controlled-circulation boiler went into service at Somerset Station of Montaup Electric Company. COPES provided the feed water control for this pioneer installation.

The COPES system begins with master excess pressure control at the boiler feed pumps. It includes COPES Flowmatic Regulators—one in each of the two feed lines—responding to the combined influences of rate of steam flow and boiler water level. It provides automatic recirculation to protect the feed pumps on light loads.

Ten years of dependable performance—handling emergencies as easily as routine operation—prove the soundness of COPES engineering and the durability of COPES equipment.

The engineers who pioneered this outstanding feed-control installation can solve your toughest job—with complete independence from other instruments and controls.

COPES-VULCAN DIVISION
CONTINENTAL FOUNDRY & MACHINE COMPANY
ERIE, PENNSYLVANIA



One of the two COPES Flowmatic Valves feeding the controlled-circulation boiler.

SIGNIFICANT DATA

Boiler.....Controlled-circulation, Combustion Engineering-Superheater, Inc
Capacity.....650,000 lb per hr
Superheater outlet conditions.....1935 psi and 960 F
Firing.....Pulverized coal or oil; tangential corner firing
Feed pumps...3, each with normal capacity of 325,000 lb per hr: discharge pressure.....2200 psi
Engineers.....Stone & Webster Engineering Corporation

COPES

BOILER FEED WATER REGULATION

speedily rebuilding the rolls and minimizing finishing operations. Troughs located beneath the work collect unused Unionmelt welding composition for re-use.

Case 73—South Carolina Textile Mill

Non-electric Magnets Reduce Fire Hazard

THE Appleton Company, Anderson, S. C., one of the country's largest producers of cotton flannels, uses an Eriez Giant Plate-type Magnetic Separator for protection from fire and from machinery damage. Unit is installed on a waste cotton conveyor line. The magnet prevents bolts, nails, clips, and other ferrous impurities in waste from striking a spark and causing a fire or machinery damage.

The plate magnet is a flat unit, as the name implies, made up of a series of powerful, stable, Alnico castings. The castings are mounted on magnetic steel plates, surrounded by an insulation strip of non-magnetic material. This strip prevents magnetic leakage when the unit is installed in machinery. Because of its flexible design (it can be made in any size) it is easily installed in existing, as well as new equipment.

Eriez Manufacturing Company's magnetic separator installed on a waste cotton conveyor line of The Appleton Company, Anderson, S. C. Magnetic separators are made of Alnico V, the most powerful magnetic material produced for commercial use.

Wagner
TRANSFORMERS
...the choice of leaders in industry

Wagner Unit Substation Transformers serve American Tobacco

One of the two double-ended unit substations equipped with 750 kva non-inflammable liquid filled Wagner transformers.

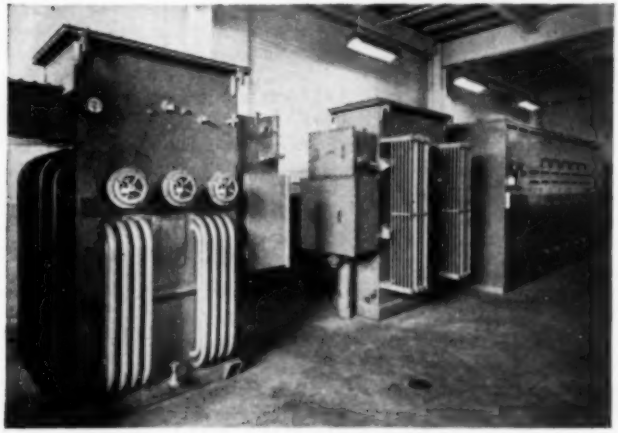
Two double-ended and two single-ended unit substations furnish power for all operations at Louisville plant...

Seven Wagner Unit Substation Transformers are used in the load-center power distribution system in the American Tobacco Company plant at Louisville, Kentucky.

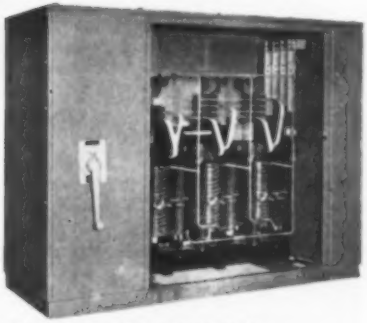
The system is formed of two identical installations—each consisting of a double-ended unit substation equipped with two Wagner 750 kva Noflamol transformers, and a single-ended unit substation with a Wagner 500 kva Noflamol transformer. Another 500 kva Wagner transformer is installed in the boiler room of the plant.

This installation furnishes power for lighting and for all operations, including the humidity control that is so important in the manufacture of cigarettes.

Wagner Unit Substation Transformers are carefully designed to meet your distribution requirements. Oil-filled and non-inflammable liquid filled (Noflamol) transformers are available with various types of entrances and controls for the high-voltage circuits, and with proper throats on the secondary side to connect to any make of switchgear.



One of the two single-ended unit substations in this plant. All transformers are 13800 to 240 volts, 3 phase, 60 cycle.



Dry-Type Indoor Transformers

Wagner three-phase dry-type load-center transformers are built in ratings through 2000 kva in the 15-kv class and below. Transformer and incoming line section are housed in compact factory-matched enclosures that are connected to matching secondary switchgear to form a closely coupled unit substation that affords ready accessibility. Bulletins TU-56 and TU-13 give full information. Write for your copies.

Wagner
Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6383 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS - TRANSFORMERS - INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS - AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

T52-10

Case 74—Mississippi

Anhydrous Ammonia Handled Safely

THE growing application of anhydrous ammonia as a nitrogenized fertilizer in the South and Southwest was handicapped for some time by the lack of safe and efficient handling techniques. This relatively new fertilizer, composed of 85% nitrogen, is good for all farm crops and is gaining popularity in all parts of the country.

A solution to the problem was found in Ingersoll-Rand's L. P. G. compressor—an ideal machine for handling such pressure-volatile liquids as anhydrous ammonia.

How to handle the fertilizer and specifically, how to transfer it efficiently from tank cars and trucks into storage tanks, challenged the industry from the start because anhydrous ammonia has to be held under extreme pressure.

In transferring the fertilizer, the L. P. G. compressor unloads both liquid and gas. It forces the liquid fertilizer out of the tank car and then, by turning a 4-way valve, draws off the gas remaining in the tank car and transfers it into the storage tank.

Case 75—Texas

Bonding with Low Heat

A SOUTHWESTERN company was faced with a production problem when it received a contract for assembling riflescopes. A high strength bond was needed that required no finishing operation. The material must be easily applied and at the minimum heat possible in order to eliminate distortion or warpage.

The assembly consists of 1015 steel tubing, 11 in. long, with an adaptor at each end and a fitting off center. EutecRod 1801, manufactured by the Eutectic Welding Alloys Corporation, was selected for the joining operation because its high affinity for steel insured high strength non-porous bonds; ease of application, and because it

STAYNEW

ABSORPTION FILTERS PROVIDE

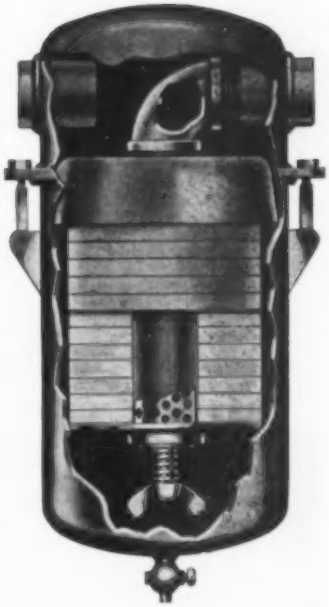
SUPER FILTRATION!

—REMOVE LAST TRACES OF OIL AND MOISTURE FROM COMPRESSED AIR LINES

The model AAPH Absorption Type Filter has proven itself to be the real answer to the elimination of costly service interruptions in utility and industrial power plants. Many manufacturing processes and certain compressed air operated equipment require the removal of condensed oil and water vapors *completely* from the compressed air. In thousands of installations all over the country, Staynew Absorption Filters remove the last traces of oil and moisture and prevent failure of combustion and other pneumatic controls . . . keep maintenance time and cost at a minimum.

For Complete Information, Write Today For Bulletin B-1A

Representatives in Principal Cities



MODEL AAPH
Absorption Filter

DOLLINGER PROTECTOMOTOR U.S. PAT. OFF. STAYNEW FILTERS

DOLLINGER

CORPORATION

40 Centre Pk., Rochester 3, N. Y.

ALL TYPES OF FILTERS FOR EVERY INDUSTRIAL NEED

fulfilled the rigid specifications for these joints. The scope is mounted in an especially prepared reversible jig and is rotated throughout the operation.

Eutectic's Anti-Capillary Compound is used to confine the flow of alloy to the specified area; to prevent oxidation, and to reduce the amount of cleaning necessary. The use of this compound reduced cleaning time by 80%, and heat discoloration was eliminated. Rejections to date have been less than 1/10 of 1%.

Case 76—Kentucky

Crusher Repairs

SOUTHERN stone products plants are finding that Allis-Chalmers jaw crushers with an improved dry rolling toggle are successfuily handling very hard material in sizes above 18 inch ring size, with greatly reduced wear and maintenance.

For example, one Kentucky cement firm reports that where the life of the older type frame toggle was approximately eight months — (over a two year period, toggle ends and seats had to be replaced three times) — the new toggle has been in use eight hours a day for two years and shows little wear.

According to Allis-Chalmers engineers, the longer life is due to the fact that the toggle ends roll rather than slide on the mating toggle seats.

The change from sliding to rolling action is accomplished by reversing the curvatures of the conventional toggle ends and seats and making the difference in curvatures sufficiently great so that the cotangent of the acute angle formed by the line of force and a tangent line passing through the line of contact is less than the coefficient of friction during the full angular movement of the toggle plate. A special rubber apron keeps material out of the toggle seats.

The dry rolling toggle also incorporates a safety shear member on the portion between the pitman and the frame. If a large timber or piece of scrap metal is accidentally

TroubleSAVING!

with 854 sizes of . . . ready made bearings for machine tools and industrial machinery.

with 324 sizes of . . . completely finished bearings for electric motors of all sizes and makes.

with 263 sizes of . . . tubular and solid Bronze Bars completely machined on all surfaces.

Bunting Ads win 1st award in contest sponsored by Industrial Distributors Associations.

Bunting Standard Stock Bearings, Electric Motor Bearings and Precision Bronze Bars offer the quickest, simplest and most economical solution to your bearing problems in production and maintenance.

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Bunting products are instantly available in all markets, from the stocks of leading industrial distributors and distributors of specialized industrial items. Ask your distributor or write for catalog.

THE BUNTING BRASS & BRONZE COMPANY • TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

fed into the crusher, inexpensive rivets shear off, thus averting what often could be a major repair job. The rivets are easily replaced in the field.

To assure a rolling action between mating toggle ends, a high coefficient of friction is desirable. Consequently, no lubrication is needed, resulting in a substantial saving in the cost of lubricant.

Since no lubricant is used, it is easy to keep the pit under the crusher clean and dry. This is an increased safety factor.

Case 77—South Carolina

CO_2 Improves Operation

CARBON dioxide has played an important part in industry throughout the nation since the war. This is particularly true in the Southern states where the use of CO_2 and dry ice has increased almost 20 per cent since 1945.

Although most of this increase has been made by new industries locating in the South and Southwest, some of it is being used to improve products and production. Two cases of interest show how CO_2 has improved production.

A Southern bleach and dye works found an easy way to neutralize the waste water of the plant before it is discharged into a stream which flows into the city water system. By the installation of a tank, water pump and CO_2 supply, they have been able to reduce the pH of the water from 12.2 to well below 8.5, which is required by the city.

Another interesting story comes from laboratories and plants that handle large quantities of mercury. This metal, which is liquid at room temperatures, is 13.6 times as heavy as water and it has always been a problem to carry it from one process to another within a plant. Liquid Carbonic's engineers simplified this job by engineering a system which piped mercury under pressure of CO_2. Although very simple in theory and easy to install, this method allows perfect control of flow by the turning of a valve.

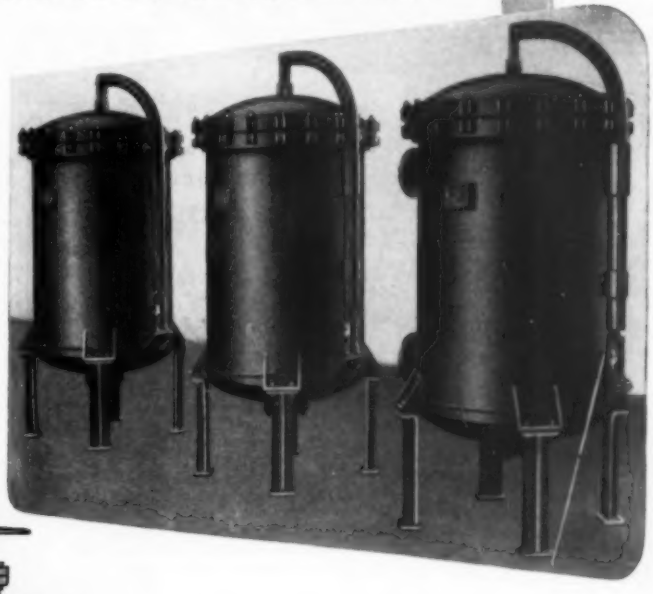
non-stop filtration

with ADAMS PORO-STONE TEAM

● Whether you choose the open filter aid precoat tank or the closed filter aid precoat system, the Adams Poro-Stone team takes your process liquids around the clock—week in and week out.

Complete package installations, ready to go on stream virtually at delivery, allow one filter to be drained, flushed clean, and precoated while the balance of the battery is in continuous service.

If cleaning or replacing clogged filter media stands in the way of making your process continuous, investigate Adams Poro-Stone CVF filters. They are available, with or without davit and swing bolts, in capacities and materials to suit most needs.



Bulletin 430 illustrates both manual and automatic operation.

Write

247 E. PARK DRIVE, BUFFALO 17, N. Y.

R. P. ADAMS CO., INC.

Case 78—Missouri Metalworking

From One Week to Three Months Between Grinds

TOOLS chipped badly for a St. Louis firm until it started using dies and punches made of a tough, non-deforming steel. This steel, a product of The Carpenter Steel Co., Reading, Pa., was used in dies for producing integral parts of buses, street cars, and railroad caboose cars.

The problem in the shop was to find a die steel that would stand up under heavy weight stock. Many of these heavy steel parts were produced on a piece-meal basis with coping dies in various size presses.

In one typical operation, a square punch and die with rounded corners was used in a 40-ton press to produce an "H" shaped part in 6 strokes. This set-up had to be used because it was impractical to produce exact die shapes for the many different parts required in less than production quantities.

It is an abusive type of job. For a while, they may be working cold rolled steel ⅛ inch thick, then change to 3/16 inch stock, or perhaps ¼ inch diamond plate. After only one week's service with the original steel used, the edges of the tools began chipping. As much as 1/32 of an inch had to be ground away on the surface of the punch and die to reach a good working edge.

Following the company's change to Carpenter's R. D. S. (Oil-Tough) Tool Steel, its dies ran three months without grinding. Even at that, the grinders removed only .010 to .015 of an inch.

Case 79—Alabama

Foundry Cuts Time by Airless Blasting

SIZEABLE savings were experienced at Continental Gin Company, Prattville, Alabama, as a result of the installation of an Airless Blasting machine in their cleaning room.

Although this gray iron foundry is a captive shop producing parts for a complete line of cotton gin machinery, it operates like a jobbing foundry due to the variety of castings required for machines in production as well as for repair parts. The daily production is 8 tons, but it is made up of small quantities of many sizes and shapes of castings.

In view of the great versatility required to handle all of the work, a Swing Table type airless blasting unit manufactured by American Wheelabrator & Equipment Corporation was installed. The cabinet at this plant has a 66 in. diameter circular table mounted on the door. When the door is opened, the table automatically comes out into the room for unloading and loading. During the cleaning, the table rotates the work under a shower of metallic abrasive thrown from one

You've got a Winning Combination

with the New

TRADE **LESLIE** MARK

DOUBLE SEATED DIAPHRAGM CONTROL VALVES

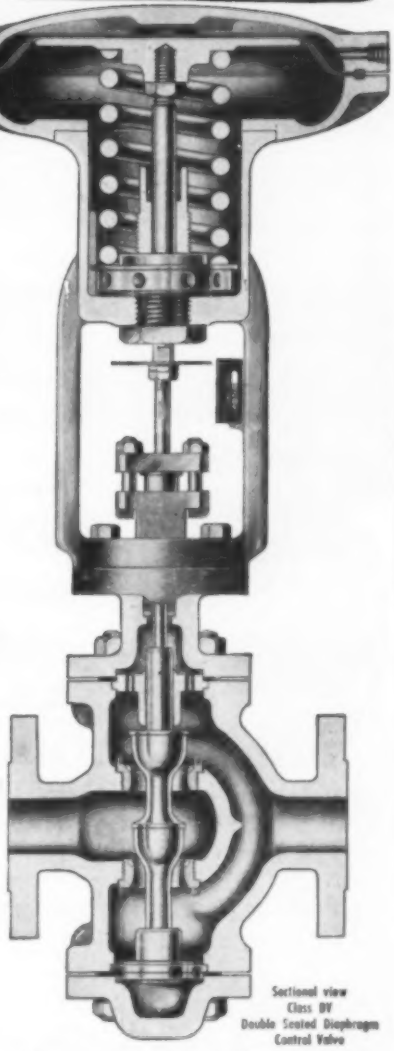
Calling a spade a spade you've got a "royal flush" of features in these new Valves designed for use with control instruments.

Their "Flow-Line" Contoured Bodies have ISA standard face-to-face dimensions and high capacity, low turbulence and minimum body pressure drop characteristics.

A new type, top and bottom guided construction is self-aligning and non-binding regardless of uneveness of bolt tightening.

Standard, integral stellited seating surfaces are recommended for steam service to reduce seat ring thread corrosion. Renewable, interchangeable seat rings also furnished where desired and may be easily replaced without removing valve body from the line. Elaborate grinding at high temperatures is completely eliminated.

With these Valves, you get as *standard equipment*, features heretofore only obtainable in expensive, specially designed valves.



Sectional view
Class DV
Double Seated Diaphragm
Control Valve

Look for LESLIE REGULATORS under "Valves" or "Regulators" in your classified telephone directory in the following cities where LESLIE factory trained engineers are located:

Albany, N. Y.	Chicago, Ill.	Galveston, Tex.	Memphis, Tenn.	Orlando, Fla.	Salt Lake City, Utah
Albuquerque, N. M.	Cincinnati, Ohio	Greenville, S. C.	Miami Springs, Fla.	Philadelphia, Pa.	San Francisco, Calif.
Atlanta, Ga.	Cleveland, Ohio	Houston, Texas	Milwaukee, Wis.	Pittsburgh, Pa.	Seattle, Wash.
Baltimore, Md.	Dallas, Texas	Indianapolis, Ind.	Minneapolis, Minn.	Ponca City, Okla.	St. Louis, Mo.
Beaumont, Tex.	Denver, Colo.	Kansas City, Mo.	Mobile, Ala.	Providence, R. I.	Syracuse, N. Y.
Birmingham, Ala.	Des Moines, Ia.	Kingsport, Tenn.	Monroe, La.	Richmond, Va.	Tucson, Ariz.
Boston, Mass.	Detroit, Mich.	Los Angeles, Calif.	New Orleans, La.	Rochester, N. Y.	Wilkes-Barre, Pa.
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***WRITE FOR* Bulletin 513**

ESTABLISHED 1900
LESLIE CO.

261 Grant Avenue, Lyndhurst, New Jersey

FLOATLESS LEVEL CONTROLS • PRESSURE REDUCING VALVES • PRESSURE CONTROLLERS
SELF CLEANING STRAINERS • PUMP GOVERNORS • TEMPERATURE REGULATORS
• AIR HORNS • STEAM WHISTLES

rotating, bladed wheel in the roof of the cabinet. The abrasive is propelled by centrifugal force alone.

This table will accommodate a few large pieces or hundreds of smaller pieces at any one time. The parts are first blasted on one side, then turned over and blasted on the other. A typical table load of parts can be cleaned on both sides in 4½ minutes.

The Swing Table replaced four tumbling mills and reduced labor requirements from 24 man hours daily to 10 man hours for a 58% saving.

Nine hours were formerly required to handle the cleaning production, but this time has been reduced by the new blaster to only five hours.

Other advantages experienced include a more thorough cleaning job, easier inspection for casting defects, elimination of dusty working conditions and a reduction in the necessary floor space for the cleaning equipment.

Case 80—Southwest

Proportioning of Bulk Materials by Weight

THE profit dollar in a bulk materials process can easily slip through the shipping dock as a "safe" blend, or proportion, containing too much of the more expensive ingredients.

Here are examples of an economical positive method of insuring precise proportioning control, not too much—not too little, to an accuracy of ⅛ of 1 per cent throughout the range from minimum to maximum production:

Example 1—A Houston chemical company manufacturing a stock feed concentrate comprised of finely ground oyster shell and a phosphate bearing material installed two Richardson Scale Company hopper type weighing machines. These two machines are electrically interlocked to weigh and discharge simultaneously but to stop and show an alarm if the weighing is interrupted by shortage of material or other reason. This is a continuous production process of about 30 tons per hour finished product. Both materials are fed from respective reserve bins to the hopper type scales which discharge to a common receiving hopper below. The material is continuously transferred from the lower receiving hopper through a screw conveyor and bucket elevator to a finished product reserve bin with intimate mixing accomplished en route. It is characteristic of this type of installation that the weighing machine is self-testing and accuracy can be checked at any time simply by observation of a beam balance. Simplicity and ruggedness in a dust confining enclosure further contribute to accurate, continuous, trouble free, clean, and economical operation. This installation replaced two operators and relieved the laboratory of the tedious burden of constantly checking and analyzing the product for quality control.

Example 2—A Gulf Coast aluminum company moved a Richard-

This large industrial power plant moves 200 tons of coal per hour from track dump hoppers through storage silos to bunkers on Link-Belt Conveyors.

Rely on one source... one responsibility for the best in belt conveyors

LINK-BELT engineering experience plus quality components combine to cut handling costs

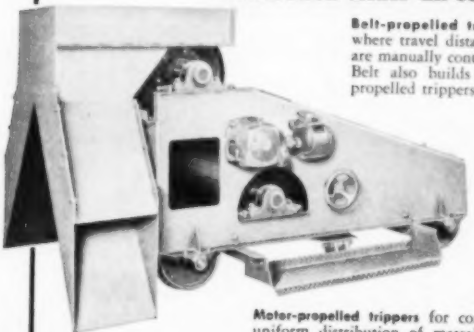
WHETHER you must move a few tons a day or several thousand tons per hour . . . whether the haul is measured in feet or miles—you'll find the answer in belt conveyors at Link-Belt.

Here's a nation-wide engineering organization that will follow through from start to finish—the designing, manufacturing, erecting of conveying equipment. And nowhere can you match Link-Belt's combination of vast application experience . . . complete line of quality components . . . expert coordination of related equipment.

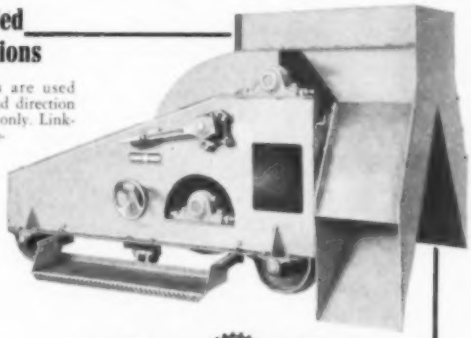
Get all the facts from the Link-Belt office near you. Link-Belt engineers are glad to work with you and your consultants—help you get the finest in belt conveyors.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

LINK-BELT Trippers offer controlled distribution under all conditions



Belt-propelled trippers are used where travel distance and direction are manually controlled only. Link-Belt also builds winch-propelled trippers.

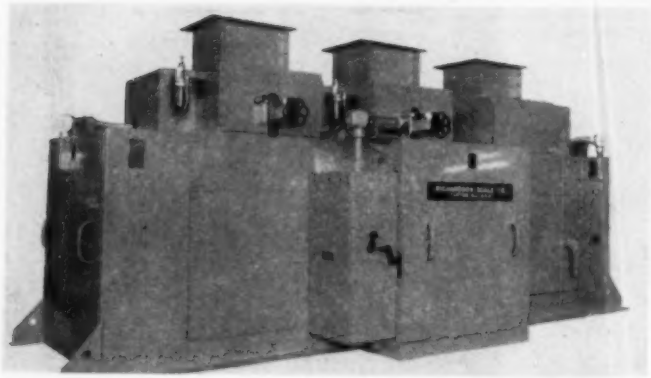


Motor-propelled trippers for continuous, uniform distribution of material along conveyor or for frequent movement to various fixed discharge locations.

12,695

LINK-BELT

BELT CONVEYOR EQUIPMENT



Three automatic scales combined for blending silica, cement, and ground scrap in asbestos siding manufacture, are controlled by remote panel with ticket batch printer.

son multiple scale installation from a defense plant installation in the Middle-west to a new modern South Texas plant. These machines accurately proportion the several ingredients required in manufacture of an expendable product used in making of aluminum.

Example 3—A Houston asbestos siding manufacturer is operating a three scale installation feeding a batch mixer and reserve tank supplying slurry to a continuous shingle machine. The scales control cement, silica, and ground scrap returns. A remote control panel with a selector dial for each scale, pilot lights, and start-stop push buttons, provides means of setting a wide range of formula at the remote control panel.

Example 4—A South Texas rice mill has an installation of four weighing machines, interconnected electrically to a remote control panel and associated conveyors to provide choke-proof, high speed, proportioning to an accuracy of ⅛ of 1 per cent.

Line Material Company's Sherman, Texas, Plant

The Sherman, Texas, plant of the LINE MATERIAL COMPANY has begun full line production on L-M Fibre Pipe which will more than double the present output of their Barton, Wisconsin Fibre Products Plant. New 50,000 sq ft factory includes an air-conditioned office building, warehouse, and power plant.

T. J. ANDERSEN is Plant Manager and W. M. BLOOM, Manager of Fibre Products Sales. Construction was handled by the MAR-LANG COMPANY of Sherman, Texas.

Enlargement of L-M's Fibre Pipe manufacturing facilities was necessitated by the ever increasing usage of this pipe for drainage, irrigation, filter bed and industrial non-pressure applications.

Case 81—Southwest

Irrigation Pumps

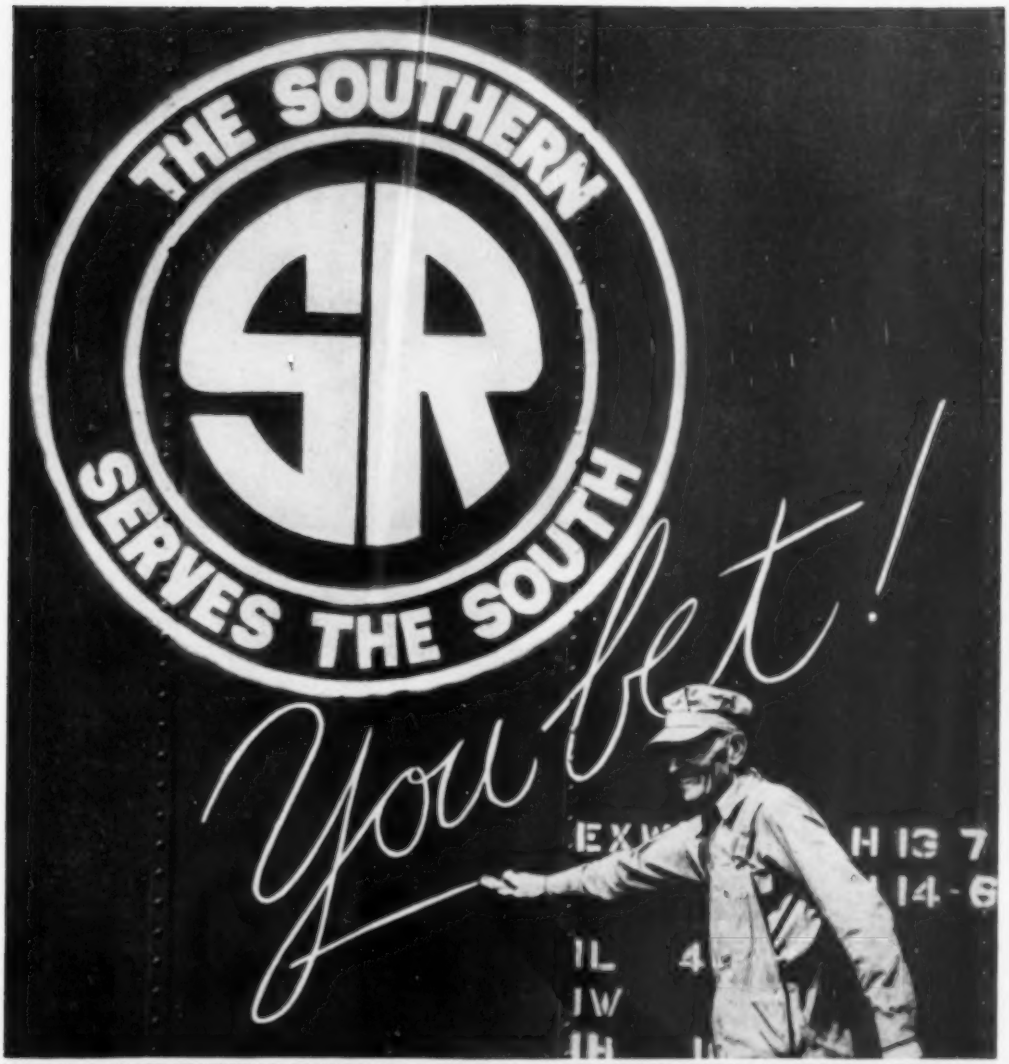
FOR the past several years the Berkeley Pump Company has provided deepwell turbine pumps with a wide range of performance choices for irrigation service.

Throughout western and southern states these pumps are giving their owners a high degree of satisfaction, because they do two jobs remarkably well. It is quite common to require a pump to deliver up to 500 gpm for commercial flood irrigation and at the same time maintain a pressure of 30 lb on the service lines running to the house and yard water outlets. Or if desired, pumps are provided whereby the entire stream lifted by the turbine impellers deep in the well, passes through a booster impeller, which goes to a modern agricultural sprinkler system where uneven ground can be irrigated without the necessity of levelling the land.

More Information Available

Many of these modern procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case histories in this 5th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply house, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N. E., Atlanta 5, Georgia. There is no obligation.



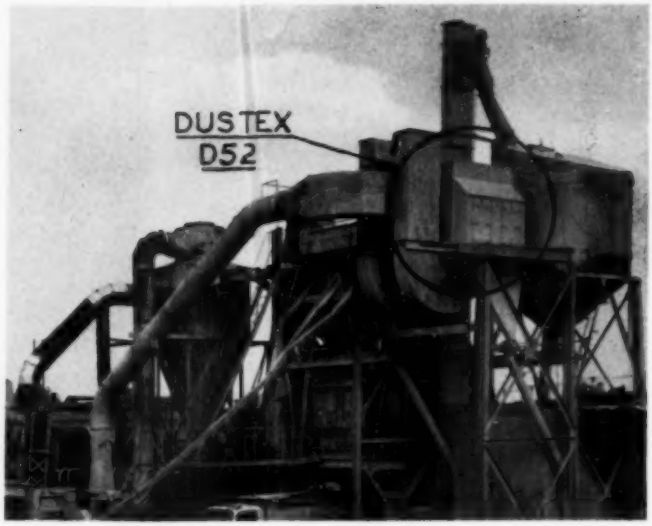
HERE'S A RAILROAD SLOGAN THAT'S REALLY JUST A SIMPLE STATEMENT OF FACT. Because east of the Mississippi and south of the Ohio and Potomac rivers, the lines of the Southern Railway System serve every state except West Virginia, and a line also reaches out across Indiana and Illinois to St. Louis. With diesel power, new and modernized yards, terminals and other facilities—and a personnel eager to please—there's a world of meaning in our slogan "The Southern Serves the South." **SOUTHERN RAILWAY SYSTEM**

Case 82—Texas

Valuable Extreme Fines Collected

AFTER installing a Dustex high efficiency mechanical dust collector for more complete recovery after a cyclone installation, a Southwestern plant found that savings in material recovered would pay for the equipment in a short while.

This collector, with high collection efficiency and no filters or moving parts, has resulted in extensive recovery of materials in dry usable form — and with minimum maintenance costs. The illustration shows the Dustex D52 collectors operating as a secondary cleaner after cyclone separators.



Case 83—Carolina Foundry

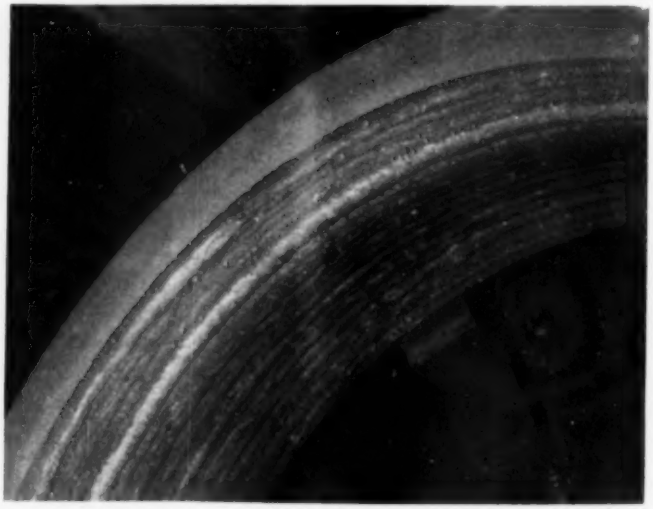
Reduced Welding Time in Depositing Overlays

A LARGE Southern foundry has considerably reduced welding time as well as operator fatigue by converting to Aircomatic welding for the deposition of overlays on iron and steel maintenance castings.

Aircomatic welding, a development of the Air Reduction Sales Company, A Division of Air Reduction Company, Inc., embraces not only some of the desirable characteristics of both ordinary electric arc and inert-gas-shielded tungsten arc welding, but also offers certain combined features.

This process employs a continuously-fed wire electrode operating within an inert gas shield which protects the weld metal. The electrode is bare wire in coil form which carries heavy currents on a relatively small diameter wire, providing high current density. High current densities provide the high deposition rate which means high speed welding as well as excellent penetration. Speed also means less time-exposure to heat. The shielding gas (either helium or argon or a mixture of both) protects the weld metal from the atmosphere.

The depth of penetration increases or decreases with the current value employed. Therefore, on overlay work a low current is used for the first layer to minimize parent metal pick-up. The second layer can be deposited with a higher heat to increase the rate of deposit. The surface to be overlaid should be free of grease, oil and scale.



The inner surface of a cast iron flange bushing for a centrifugal casting machine was overlaid with Airco 928 aluminum bronze. The bushing is shown with the first layer completed and the second or top layer two-thirds completed. The deposited metal is uniform and metallurgically sound. On the first layer, 225 amp, d-c reversed polarity, and 50 cfh argon were employed. The second layer was deposited with 275 amp d-c reversed polarity and a shielding gas mixture of 40 cfh helium and 10 cfh argon.
Arc time required to complete two layers, totaling ⅜" thick x 6" wide x 24" diameter, was 2½ hours. A total of 30 pounds of aluminum bronze wire, 1/16" diameter, was used.

TERRY

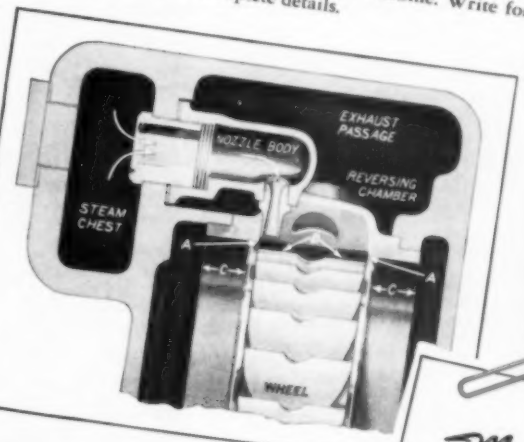
LARGE CLEARANCES *take the "worry" out of* Turbine Operation

In a Terry Solid-wheel Turbine the power-producing action of the steam in the wheel takes place on the curved surfaces at the back of the buckets. This unique design permits unusually large blade clearance—see B in the diagram.

Even if this clearance becomes reduced, there is no real cause for worry. The blades still cannot foul because they are further protected by projecting rims at the sides of the wheel. These rims, which also have ample clearances (*AA*), will take without damage any rubbing that may occur.

Side clearance, *CC*, is so large that end-play from external thrust will not damage the wheel. This clearance is one inch or even greater.

Large side and blade clearances are only two of the many features of the Terry Solid-wheel Turbine. Write for complete details.



THE TERRY STEAM TURBINE CO.
TERRY SQUARE, HARTFORD 1, CONN.

TT-1191

Memo

Send for a copy of bulletin S-116 which describes the many advantages of the Terry Solid-wheel Turbine.

Maintenance Procedures

(*Continued from page* 146)

fast-moving steam, which is only distributing agent for obtaining coverage from oil inside steam cylinders.

Engineers of the Sharvania Oil & Grease Corp., Memphis, Tennessee, recommended and installed five Lube-O-Mizers in the main steam line and the intake manifolds of each engine, utilizing that number of lubricator feeds for introducing their special lubricant, Shar-Cylinder-Lube. This passes through the Lube-O-Mizers and into the steam mains well ahead of all cylinder intake valves, to provide more "time."

The remaining 14 feeds were gradually reduced to feeding very small quantities of oil until almost all of these feeds were eliminated entirely. Inspection revealed that satisfactory results were being obtained from the five feeds introducing the lubricant through that number of Lube-O-Mizers back in the steam mains leading to each engine.

The result has been (1) greatly improved lubrication performance inside the cylinders, with cylinder walls, rings, piston rods, and also the rod packing being more efficiently lubricated; (2) oil consumption considerably reduced for engines of this size; (3) more freedom from oil-contaminated exhaust steam returns to the boilers, due to the elimination of wasteful feeding of unatomized oil directly into the exhaust; and (4) substantial savings in both oil and maintenance costs.

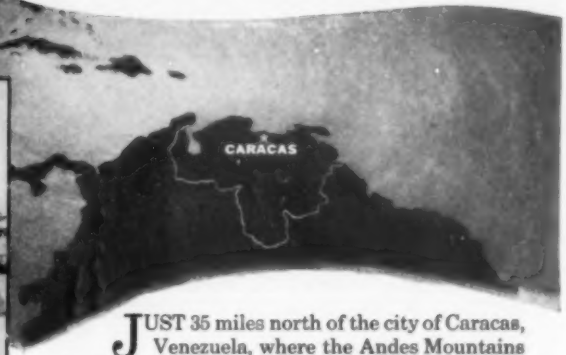
Case 84—Alabama

Lubricants Reduced

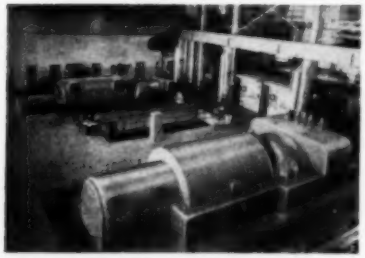
A PROGRESSIVE mill in Alabama has had considerable experience with Bijur central lubrication on the head ends of their spinning frames. This mill has at present 419 frames on which the savings, due to improved lubrication, have been recorded as shown by the following figures:

More Power to South America

from Pritchard



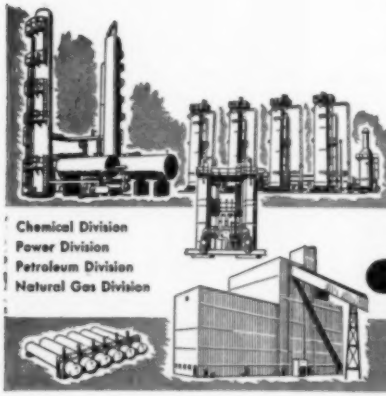
JUST 35 miles north of the city of Caracas, Venezuela, where the Andes Mountains rise from the Carribean, a new, modern building is nestled in a small valley on the seacoast. This building contains a *40,000 kilowatt* steam electric power station which ties into the distribution system serving the industrial and residential needs of the Federal District of Venezuela.



Interior of the 40,000 kw. steam electric power station designed and built by J. F. Pritchard & Co. near Caracas, Venezuela.

Designed, engineered and constructed by Pritchard, the Arrecifes Power Station of C. A., La Electricidad de Caracas, has boilers, turbines and all auxiliary equipment arranged for unit system operation without cross connection. This installation is another fine example of the many outstanding Pritchard-built plants that are providing maximum efficiency at lowest cost.

Whether *your* need is for a complete new plant, alterations or expansion, Pritchard provides the sound design, engineering and construction services that pay off in operational efficiency and trouble-free service. Your inquiry is invited.



Chemical Division
Power Division
Petroleum Division
Natural Gas Division

For Complete Information, Write

NATIONAL CONSTRUCTORS ASSOCIATION MEMBER

J.F. Pritchard & Co.

DESIGN • ENGINEERING • CONSTRUCTION

Dept. No. 283 — 908 Grand Ave., Kansas City 6, Mo.

District Offices: CHICAGO • HOUSTON • NEW YORK • PITTSBURGH
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Head end bearings, oil twice weekly

Hand lubrication—80.58 man hours per week (Frame out of production)

Central lubrication—2.05 man hours per week (Frame running)

Savings in labor—78.53 man hours per week

Savings in down time—78.53 man hours per week

These figures do not include oiling of rolls, spindles, etc., but are comparative figures on head end bearings only. The time required for filling the lubricator reservoir is also not included, as this is offset by the time required to fill the oil cups, which in either case occurs approximately once per month.

This mill makes the positive statement that centralized lubrication has demonstrated a saving of 33% to 50% of oil over hand oiling.

Case 85— Georgia

Impact Wrench Drives Leg Screws

DRIVING 5/16 inch leg screws having standard bolt size threads on the exposed end was the problem which existed in a Georgia plant where radio and television cabinets are manufactured.

Standard procedure was to use

a brace and bit with a threaded socket to drive the leg screws. After driving, the threaded socket had to be removed from the exposed stud; time required for the operation was approximately 45 seconds.

A Cleco A-3 Reversible Impact Wrench, with an Apex #011 5/16 inch stud setter attachment, was applied to the operation and the leg screw driven and the wrench removed from the exposed stud in approximately 8 seconds. The net result was less operator fatigue, more uniform production, and a time saving of approximately 35 seconds per stud. The wrench paid for itself in 28 working days.

Case 86—Alabama

Machinery Vibration Reduced

A LARGE Southern ordnance plant has reduced machinery vibration and facilitated installation by use of anti-vibration pads. The Unisorb pads used in this instance were furnished by The Felters Company. Reports indicate that they have been extremely satisfactory both from the standpoint of reducing transmitted vibrations, and also in saving time and labor of machine installations, due to the elimination of need to lag machinery to the floor.

Case 87—Texas

Rod Cutter

HEAVY DUTY cutters of the Cutter & Industrial Division of H. K. Porter, Inc., are being successfully used by a San Antonio, Texas, contractor to cut ⅝ in. concrete reinforcing rod.

The contractor had been using regular rod cutters, but the size of the material and its toughness, tired the operator. Heavy-duty cutter now doing the job is a No. 4 Porter, which makes use of the full power of the tool by increasing the applied power through a reduction gear box and chain sprocket. Cutting is now done easily and quickly from 10 to 15 seconds per cut — without excessive demands upon the strength of the operator.

Section 10

Piping and Valves

Process piping quickly weatherproofed . . insulation offers fuel savings . . eliminating water and oil from compressed air lines . . unit trapping pays off . . how to combat corrosive attack in condensate return lines.

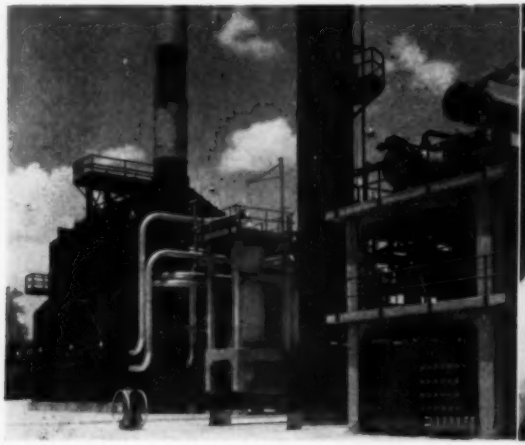
Case 88—Texas Refinery

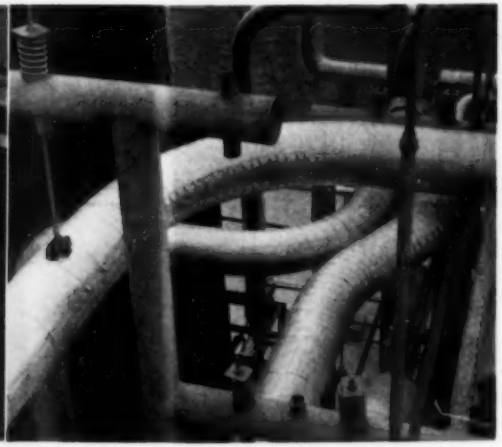
Aluminum Jacketing Protects Lines

JUST six months from ground breaking to on stream! That's the record set by the staff of Eastern States Petroleum Company in constructing their new UOP Platforming Unit with the cooperation of the Universal Oil Products Company. This new unit upgrades gasoline quality and provides vitally needed aviation base stock.

But the speed with which this unit was constructed did not lead Eastern States to overlook any details. Childers Aluminum Weatherproof Jacketing was specified for weatherproofing of important transfer lines. These discharge and return lines are made of expensive alloy and are insulated with micalite and magnesia. Eastern States selected Childers Jacketing with moisture barrier attached to give long time, economical protection to

This new Platformer at Eastern States Petroleum Co., Plant No. 2, Houston, produces 7,000 barrels of vitally needed high grade gasoline products daily. *Childers* Jacketing is seen on main transfer lines leading to and from furnace. The versatility of *Childers* Jacketing is shown at right. Covering several different sizes of lines and taking the Jacketing around various turns and angles was accomplished by on-the-job cutting with a paper knife.





these vital lines. Requiring no painting or maintenance this jacketing provides many years of protection for the insulation and resists corrosion.

Eastern States own workmen found it easy to apply Childers Jacketing even on tricky curves. They used a paper knife to cut the jacketing on the job, and needed only a pliers and wedge to secure the aluminum strapping that holds it in position. To take the jacketing smoothly around turns and curves, they cut strips varying in length and width with the size of the line and the radius of the curve. As each strip was strapped around the line, the corners of the leading edge, which was to be covered by the lap of the next piece, were trimmed to eliminate bulking. After a few minutes of experiment with this technique, Eastern States staff covered lines of various sizes quickly and smoothly.

Case 89—Georgia

Fuel Savings Pay For Piping Insulation

IN a Georgia food processing plant, in operation somewhat over five years, the need for insulation was forcefully demonstrated when an economy study showed that more than five hundred dollars

Sectional 85% Magnesia insulation was applied throughout the plant to reduce excessive heat losses. Man at left is preparing canvas jacket; man at right is pointing up pipe bend with asbestos insulating cement.

per month was being spent for lost heat. These losses stemmed directly from thousands of square feet of uninsulated steam piping, and a host of uninsulated valves and fittings.

Since more than 900 feet of piping of various sizes were located out-of-doors—some of it was installed in a culvert, but the culvert was open at each end and thus allowed a free flow of convection currents—so much heat was dissipated that noticeable quantities of the generated 155 psig saturated steam would condense before doing any work.

The following are figures brought to light by this study. Annual consumption of fuel oil, at $0.059 per gallon, amounted to $85,000. Of this, it was calculated that *close to $7,000 per year was being spent to heat up the atmosphere.* On the other hand, it would take a one-time investment of $10,000 to insulate all the exposed piping, valves, and fittings with 85% Magnesia.

Procedure

Based on these figures, management decided to insulate the plant's piping system completely. After all piping connections were made pressure-tight and the piping cleaned of any irregularities, sectional 85% Magnesia was applied. The insulation was fastened into place with annealed iron wire and finished with a wrap of rosin-sized paper and a sewed jacket of 8-oz canvas.

Flanges and fittings were insulated either with 85% Magnesia sections or block, depending on their sizes. A ¼ in. layer each of asbestos insulating and hard finish cement was then applied to complete the work.

Cost studies available at this writing indicate that the original estimate of "saved heat" was conservative. Not only is the insulation eliminating unnecessary condensation, but it has also helped to reduce the load on the boilers—usually operated at 260 per cent of rated capacity—decreased maintenance requirements, and lowered flue gas temperature. At this rate, the insulation will have paid for itself in about twenty-one months.—*C. T. Baker, Consulting Engineer.*

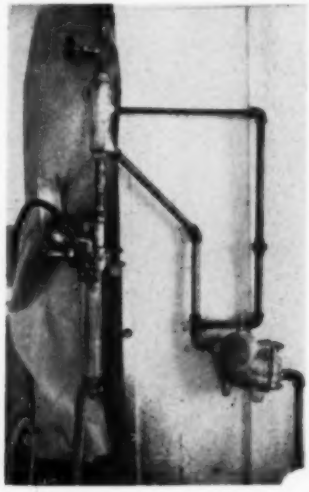
Case 90—Texas

Dry Air Saves for Furniture Factory

THE Olive & Myers Co. of Dallas, Texas, was experiencing a common problem which plagues finishing departments of many industrial manufacturers. Due to water in the compressed air lines of paint spray equipment, many case goods pieces had to be refinished with a loss of time and money.

The Murry Co. of Texas, an industrial supply company in Dallas, suggested to The Olive & Myers Company that they install Hi-eF purifiers in front of their spray nozzles to eliminate any water in the air lines. Three ¾ in. purifiers were purchased from the V. D. Anderson Company, with three ½ in. float traps to drain the purifiers.

Since the installation of these purifiers and traps, no refinishing has been necessary. The spray nozzles have been entirely free from contaminating water, which is effectively separated and ejected to the traps by the purifiers. The photograph gives a close-up view of the purifier and trap installation.



Case 91—Florida

Higher Temperatures Mean Faster Drying

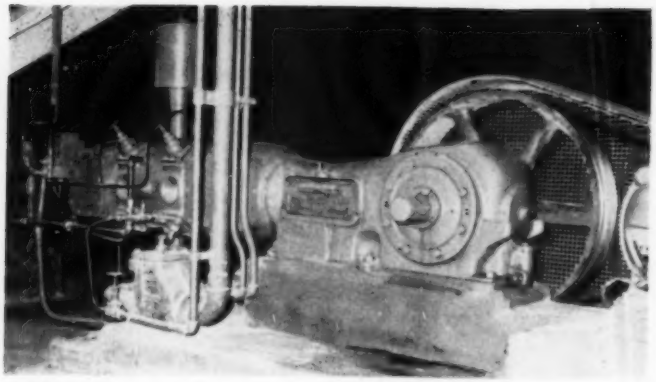
THE PLANT of the Palmetex Corp., Pinellas Park, Fla., was converted to the manufacture of wallboard. A dryer was designed and built locally. The 400 ft dryer consisted of twenty sections, each having two steam coils and an air circulating system. Each section had its own inverted bucket trap, which, unfortunately, failed to function properly. Even though the wallboard was in the dryer for over four hours, it was never completely dried. Additional air drying was necessary.

H. K. Wilson, Sales Engineers, of St. Petersburg, Florida, state distributor for Coe Drainators, was called in for advice. Pyrometer tests showed that with 135 lb boiler pressure, the temperature of the condensate entering the traps was from 190-240 F. After replacing the bucket traps with Coe Drainators, the temperature on entering the traps was within 10-15 degrees of the steam temperature with the result that the board was delivered perfectly dry with the same steam pressure.

More Information Available

Many of these modern procedures and improvements, plant tested in Southern and Southwestern plants, can be put to work towards increasing production in your own plant. Case histories in this 5th Annual BETTER PRODUCTION Issue are necessarily brief. Emphasis is concentrated on direct information—need and objectives, description of improvements, and results.

To assist you in putting these ideas and methods to work, equipment and supply manufacturers have been identified in most cases. If additional information is desired, contact your local mill supply bouse, manufacturers representative, the equipment manufacturer, or drop a note to the Editors of Southern Power & Industry, 806 Peachtree St., N.E., Atlanta 5, Georgia. There is no obligation.



Case 92—Texas

No Oil in Compressed Air

THE Pennsylvania air compressor shown here is operating a Texas utility company plant. The outstanding thing about the Oilfreair compressor is the fact that it is guaranteed to provide air which is absolutely free of any trace of oil or oily vapors due to lubricants.

Also of interest is the Pennsylvania Airchek Valve visible in the discharge line, resting upon the concrete base just in a vertical line and beneath the intake air filter. This check valve dispenses with the globe and safety valves commonly used, and simplifies the installation. As operation of the check valve is entirely automatic, danger of damage through failure of the operator to open a valve is removed.

Case 93—North Carolina

Unit Trapping

THE Wells-Oates Lumber Company, of New Bern, N. C., recently purchased three of the most modern dry kilns in the area, complete with wet and dry bulb controls.

When an Armstrong representative suggested that the kiln drying cycle could be shortened by quicker warm-ups on all dry bulb temperature changes, B. H. Oates was willing to listen.

The idea of "unit trapping" the dry kiln coils seemed logical to Mr. Oates. With one trap on each of the four coils of the kiln, *all* coils would be properly purged of condensate and air, and it would be impossible for one coil to influence the operation of another coil. Four traps were installed on one of the three kilns, on trial. This trial resulted in a decrease in cycle time from 72 hours to 66 hours, which increased kiln capacity more than 8%.

Case 94—North Carolina

The Big Drip is Gone

SOMETIMES the solution to one problem only leaves another to be solved. Not long ago, our Roanoke Mills No. 1 needed to increase the water supply to its dye house. As is the case frequently in mills built many years ago, facilities and departments needing those facilities are no longer close together and additional installations must be made.

In this case, we had the choice of a short run of 6" pipe for about 115' straight across a weave room ceiling or a longer underground run of about 450' around the buildings. We chose the short line across the weave room hoping that anti-sweat insulation would check condensation on the outside of the pipe. Our hopes were doomed.

Within a few days after applica-

Freedom to Sell is Vital to us All

Eight decades ago 70% of all gainful workers in the U. S. A. toiled in agriculture. Today farms and factories, put together, account for less than 40%.

Where do the rest serve? Chiefly in distribution, which includes the physical movement of products to buyers, and all forms of selling, advertising and sales promotion at the manufacturing, wholesale and retail levels, as well as the widely varied services related to the maintenance and use of American products.

With over 60% of our total labor force falling outside of farm and factory employment, obviously salesmen on the front line of selling contribute greatly to the productivity, prosperity and the world's highest standard of living enjoyed by the U. S. A.

Without sales a business fails and jobs vanish. No matter how good a product may be, it must be sold in competition with other goods. A salesman sometimes finds his products not truly competitive. He then exercises tremendous pressures on his employer for better products, lower prices, or both. Thus, competitive selling greatly influences the progress of American prosperity.

Countries where selling is inefficient, restricted or eliminated generate far less wealth, happiness and security.

Competition, especially competitive selling, is a great American Freedom. Let us preserve it to assure Progress For All Our People.

• • •

THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

tion, the anti-sweat insulation was soaked and water began to ruin warps on the looms below; the floor was wet; and the weave room overseer's temperature reached a new high.

Tests revealed that the 6" pipe line containing water at 40 F was installed in air ranging from 85 to 90 F temperature and 90 to 95% relative humidity, the job having been completed during winter months. We then called on Johns-Manville engineers for recommendations to cure our specific trouble. Their recommendation was Standard Brine Rock Cork pipe covering 3.19" thick plus loose materials for flanges and fittings.

We purchased the Rock Cork covering as specified and our maintenance force made the installation. It took one entire day just to lower the humidity and temperature in the room to a point where the pipe could be kept dry. The end result has been exactly as desired. By carefully following the application instructions a good covering job was obtained. The big drip is with us no longer.

Robert J. Tucker, Jr.
Plant Engineer
Roanoke Mills Company

Case 95—Arkansas Gasoline Plant

Corrosion Stopped in Condensate Return Lines

MANY industrial plants in the Southwest are troubled with costly maintenance due to loss of steam condensate return lines from the action of corrosion. An example of what can be done in combating such corrosion is given in this case history of a natural gasoline plant located in Arkansas.

For some time after construction of the plant no difficulties were observed with corrosion in the return system, but later it was evidenced by a number of leaks in pipes of small diameter, mainly at the threaded joints. Short lengths of pipe removed for replacement were examined and found to be badly corroded. Many were grooved along the bottom resulting in reduction of the wall thickness until small leaks occurred at the threads.

Engineers and chemists from E. F. Drew & Company, Inc. made a complete survey of the plant, analyzed samples of the water used for boiler makeup and ran tests on the steam condensate. The boiler feedwater was found to contain 30 ppm of total alkalinity. In the heat of the boiler this alkalinity broke down to release free carbon dioxide gas into the steam. When the steam condensed the carbon dioxide gas went into solution in the condensate to form carbonic acid which was responsible for the corrosion in the return system. Tests on the steam condensate showed a pH as low as 5.0 which is very acidic and a definite indication that rapid corrosion was taking place.

Oxygen is also known to contribute to corrosive action. In this case, however, oxygen was removed from the feedwater by a deareating heater.

The Drew Company's solution to the problem was to recommend raising the pH of the condensate to a range that would be non-corrosive, that is, to 7.0 or slightly higher. To accomplish this an organic ammonia compound, Drew SLCC, was used. The action of this material is to release a volatile alkali into the steam. The alkali in turn dissolves in the return condensate and neutralizes the carbonic acid.

The quantity of compound required depends upon the amount of steam generated and the carbon dioxide content. In this case approximately 1,500,000 lb of steam are generated in 24 hours. From the alkalinity of the feedwater the carbon dioxide content of the steam was about 20 ppm. To neutralize this quantity of carbon dioxide a dosage of approximately 12 pounds

of SLCC was estimated.

At first the treatment was fed continuously to the boiler feedwater so that the volatile material would pass over with the steam. This method effectively raised the pH throughout most of the system from a low of 5.0 to the recommended value of 7.0. Control was set at a pH of 7.0 to 7.5.

Tests for pH were run at several selected points. After a number of these tests had been run it was found that in order to maintain the pH in some areas at 7.0, other areas were over treated and the pH rose as high as 8.5.

At this point it was decided a better means of feeding would be required to balance the system to give a uniform pH. As a start a pump was installed in the area where pH was found to be lowest. Material was injected locally in the hope that control could be maintained at the worst portion of the system and that the remainder of the system would come under proper control also.

After the pump was installed the entire dosage of 12 pounds was fed through the pump and no treatment was added to the boiler, the material fed through the system returning to the boilers with the return condensate. In the boilers the treatment volatilized and passed over with the steam to reach the remainder of the system. As soon as this was done the pH readings became uniform for all points and there has been no further difficulty with control.

With proper controls it was now possible to run corrosion tests on the condensate to determine results of the treatment. To accomplish this special test specimens were installed in the condensate lines. The specimens were carefully weighed before installation and left in place for about a month. During this time they were subject to the same corrosive action that acted on the pipes. After the specimens were removed they were cleaned and again carefully weighed. The loss in weight is an indication of the rate of corrosion.

The results of the tests indicated satisfactory control, and this fact was confirmed by experience when maintenance on the return system was reduced to practically nothing.

Buildings and Equipment

(*Continued from page 156*)

stallation of silencing equipment. Curve No. 2 shows the noise spectrum of a cutting machine with I.A.C. Silencing Equipment installed, the overall noise level being 91 db. Note that curves No. 2 and No. 3 practically coincide, curve No. 3 showing the background or ambient noise level which exists in this factory without the cutting machines in operation. The noise reduction obtained here is, therefore, very close to the maximum reduction possible in this case and amounts to more than 90 per cent in terms of loudness units as perceived by the average human ear. Curve No. 4 shows the noise level inside the silencing enclosure with outside unsilenced cutting machines in operation.

Case 96—Southern Pipe Line

Temporary Buildings Become Permanent

THE Plantation Pipe Line Company has just completed a 52 million dollar expansion program including a new 700-mile line from Louisiana to North Carolina.

During construction, they needed temporary warehouse and office space at seven sites. Eventually they planned to have four permanent warehouses, one at each pumping station. For the permanent buildings they wanted approximately 3400 square feet of floor space. At the temporary sites they required from 1400 to 2000 square feet.

After considerable study, the company decided on Armco Steelox construction for the temporary buildings. Then, after construction was complete, these seven structures could be combined to provide the permanent warehouses.

NEWS for the South and Southwest

SASI Elects James F. Crist

JAMES F. CRIST, President of the Gulf Power Company, Pensacola, Florida, and Vice-President of the Southern Company, with offices in Birmingham and Atlanta was recently elected President of the SOUTHERN ASSOCIATION OF SCIENCE AND INDUSTRY. Mr. Crist will fill the unexpired term of Mr. A. B. Paterson, who died recently.

James F. Crist

Commenting on the selection of Mr. Crist, SASI Board Chairman M. P. Etheredge, who is Dean of Science at Mississippi State College stated: "we are delighted to have a business man of Mr. Crist's recognized ability assume this important responsibility. Having engaged in the promotion of economic and technical progress in the South throughout his very active business career, he is exceptionally well qualified to furnish leadership for the SASI's expanding program."

Sarran of Atlantic Steel Assumes OPS Post

MILTON C. SARRAN, manager of Atlantic Steel Company's Warehouse Division, has been appointed Chief, Warehouse Branch, Iron and Steel Division, Office of Price Stabilization.

Mr. Sarran will actively resume his Atlantic Steel post November 1, when the company's new and expanded warehouse facilities will be in full operation.

In his OPS position, Mr. Sarran will be in charge of all pricing problems of the steel warehouse group. He will relieve Charles Sweet who is returning to his duties with Joseph T. Ryerson & Sons, Chicago.

Mr. Sarran has managed Atlantic Steel Company's Warehouse Division since it began operation in 1947. He has been with the company since 1933.

FUTURE EVENTS Of Engineering Interest

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, H. H. Henline, Sec'y, 33 West 39th St., New York 18, N. Y.
Oct. 13-17, Fall General Meeting, New Orleans, La.

NATIONAL ASSOCIATION OF PURCHASING AGENTS, George R. Renard, Exec. Sec'y, 11 Park Place, New York 7, N. Y.
Oct. 19-21, 7th District, 9th Annual Conference of Purchasing Agents of the Southeast. J. R. Carmichael, Conference Program Chmn., Atlanta, Ga.

AMERICAN SOCIETY FOR METALS, W. H. Eisenman, Sec'y, 7301 Euclid Ave., Cleveland 3, Ohio
Oct. 20-24, National Metal Congress & Exposition, Philadelphia Convention Hall, Philadelphia, Pa.

EDISON ELECTRIC INSTITUTE, H. S. Bennion, Mgng. Dir., 420 Lexington Ave., New York 17, N. Y.
Oct. 23-24, Transmission & Distribution Committee, Hotel Adolphus, Dallas, Texas

SOUTHERN ASSOCIATION OF SCIENCE & INDUSTRY, J. D. Capps, Chmn., Chemistry Dept., Alabama Polytechnic Institute, Auburn, Ala.
Oct. 23-24, Southwide Chemical Conference, Auburn, Ala.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Wm. F. Lowe, Sec'y, 422 Kennedy Bldg., Tulsa 3, Okla.
Oct. 24, Regional Meeting, Blackstone Hotel, Tyler, Texas
Nov. 21, Regional Meeting, Herring Hotel, Amarillo, Texas
Feb. 27, 1953, Regional Meeting, Scharbauer Hotel, Midland, Texas
Apr. 29-May 1, 1953, 32nd Annual Convention, Rice Hotel, Houston, Texas

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, C. E. Davies, Sec'y, 29 West 39th St., New York 18, N. Y.
Oct. 30-31, Fuels and AIME Coal Divisions Joint Conference, Bellevue-Stratford Hotel, Philadelphia, Pa.
Nov. 30-Dec. 5, Annual Meeting, Statler Hotel, New York, N. Y.

AMERICAN GAS ASSOCIATION, H. Carl Wolff, Mgng. Dir., 420 Lexington Ave., New York 17, N. Y.
Oct. 27-Nov. 1, Annual Convention, Auditorium, Atlantic City, N. J.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Charles F. Roth, Mgr., Publicity Dept., 26th National Power Show, Grand Central Palace, New York 17, N. Y.
Dec. 1-6, Twentieth National Exposition of Power & Mechanical Engineering, Grand Central Palace, New York, N. Y.

OG&E Promotes Blake, Walton

OKLAHOMA GAS & ELECTRIC CO. has named J. W. BLAKE as Superintendent of Generation, to succeed C. C. Willis, who died recently. Mr. Blake came to the company as a mechanical engineer in 1936. Five years later he was promoted to Assistant Superintendent of Generation, in which capacity he served until his present appointment. Replacing Blake as Assistant Superintendent of Generation is A. W. WALTON, formerly Chief Electrical Engineer for the department.

Springfield Boiler—Atlanta

SPRINGFIELD BOILER CO., Springfield, Illinois, announces the appointment of HOMER J. HANSEN of 608 Grand Theatre Bldg., Peachtree St., ATLANTA, GA., as sales representative for its products which include bent tube boilers, straight tube boilers, superheaters, desuperheaters, air heaters, economizers, and package boilers.

Mr. Hansen is well known throughout the steam generating industry. After his graduation from college in 1935, he spent three years in Chattanooga, Tenn., in a boiler manufacturing plant, following which he served in the field of erection, service, and as a field engineer. For the last several years, Mr. Hansen has been engaged in the sale of power plant equipment in Atlanta as a manufacturer's representative.

H. R. Davies—New Orleans

H. R. DAVIES SALES & ENGINEERING has announced a new location of its office at 1209 Pere Marquette Bldg., P. O. Box 934, NEW ORLEANS 8, LA. The company represents its same principles and expects to give better service at the new location.

20th National Power Show

Major improvements in power equipment to be seen at the 20TH NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING, to be held in Grand Central Palace, New York, next December 1 to 6, will reflect a marked trend toward the fully automatic generating station, a quick review of the known plans of exhibitors reveals. The automatic power plant is a reality already, but its recognition by the engineering profession as a basic element in design is a new development that is entering into long range planning, spurred by the continuing expansion of power demand.

Feedback, coupled combination controls for the entire equipment of the central station or industrial power plant have been in use for several years as auxiliaries for existing units, but the multiplication of new equipment in this line, and its rapid assimilation by engineers have led to a new line of thinking, in which future plants are being planned from the beginning as completely integrated units. Many new exhibits at the Power Show will disclose innovations designed to fit advanced concepts of the unified power plant.

Automatic power generation is compatible with the rapid advance of automatic process control, for which much of the equipment at the exposition has also been developed.

The annual meeting of the ASME will be held during the week of the show, which is under the management of the International Exposition Company, with permanent headquarters in Grand Central Palace. Charles F. Roth is manager of the exposition. E. K. Stevens, who has long been active in this work, is associate manager.

WHAT'S NEW and Where to Get It

B-10 **SELF-LOCKING FASTENER**—Catalog No. 800, 16 pages—Case histories and engineering data for the "Rollpin" self-locking fastener are featured. Photographs illustrate use of the device as a substitute for rivets, cotter pins, set screws, stop pins, positioning dowels, lock pins, and shaft keys.—ELASTIC STOP NUT CORPORATION, Sales Dept., 2330 Vauxhall Road, Union, N. J.

B-11 **TOOL AND DIE SALVAGE**—"Tool and Die Salvage Welding" Manual, 64 pages—This "how-to-do-it" book is devoted to tool and die salvage welding procedures, including salvage of heavy duty press dies. Illustrated.—EUTECTIC WELDING ALLOYS CORPORATION, 172nd St. and Northern Blvd., Flushing 58, N. Y.

B-12 **FLEXIBLE COUPLING**—Bulletin 2200, 4 pages—Describes De Laval Crown Coupling, including complete information on construction, horsepower ratings, speeds, applications, and selection. Illustrated with line diagrams and photographs.—DE LAVAL STEAM TURBINE COMPANY, Trenton 2, N. J.

B-13 **TWO-DRUM BOILER**—V-C Bulletin, 16 pages—Describes and illustrates 2-drum boiler of the integral furnace type, with information and dimensional data on two designs available in a variety of sizes for oil, gas and stoker firing. Typical installations are shown.—ERIE CITY IRON WORKS, Erie, Pa.

B-14 **CONTROL VALVE**—Bulletin 308C, 4 pages—Describes the Cammatic Valve, especially adaptable for use in larger industrial, utility, and other plants where boiler feedwater is extensively used. Illustrates and explains application for automatic water softening, pressure filtering and other chemical process cycling control.—BELCO INDUSTRIAL EQUIPMENT DIVISION, INC., Paterson 3, N. J.

B-15 **WATER FILTERS**—Bulletin WC-107, 12 pages—Describes details of design and construction of pressure type filters for the removal of visible suspended matter from water. Discusses available arrangements of valves and piping, and selection for individual requirements. Includes installational photographs and tables of specifications.—GRAVER WATER CONDITIONING CO., Dept. 13-7, 216 West 14th St., New York 11, N. Y.

B-16 **ASH AND DUST HANDLING**—Catalog No. 652, 8 pages—"Pneumatic Ash and Dust Handling Systems" are illustrated and described. Topics covered include pneumatic system components; ash hoppers; grids and clinker grinders; transport pipe and fittings; cyclone collector equipment; storage silos; unloading equipment, etc.—THE ALLEN-SHERMAN-HOFF CO., 249 E. Lancaster Ave., Wynnewood, Pa.

B-17 **MATERIALS HANDLING**—Bulletin G-3, 18 pages—Illustrates and describes "Mansaver Grabs" for handling materials in the steel, brass, aluminum, paper and other industries.—MANSAVER INDUSTRIES, New Haven, Conn.

B-18 **PORTABLE CUTTING TOOLS**—Catalog No. 252, 4 pages—Describes line of portable cutting tools, ranging from economical, light-weight hand cutters to larger, high-capacity bolt cutters, for cutting steel rod, wire, fence, steel strapping, high tension wire, and other materials.—MANCO MFG. COMPANY, Bradley, Ill.

B-19 **ROD PACKINGS**—Lattice-Braid Bulletin, 8 pages—Contains sectional drawings showing structure of Lattice-Braid Packings, illustrations of different types, tables showing general service recommendations and specifications, and reports from users.—THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

B-20 **FLOORING COMPOUND**—"Roc-Wood" Brochure—Describes newly developed flooring compound for reclamation and maintenance of industrial floors. Drawings and photographs illustrate applications.—ROC-WOOD FLOORING, INC., 2268 South Parkway, Chicago 16, Ill.

B-21 **CONVEYING EQUIPMENT**—Catalog GC-52, 28 pages—Covers Rapistan conveying equipment with photographs, drawings, and specifications of an enlarged line of power and gravity conveyors, hand trucks, and industrial casters, including several new equipment models. — THE RAPIDS-STANDARD CO., INC., Dept. GC, Rapistan Bldg., Grand Rapids 2, Mich.

B-22 **PRECISION GEARS**—Folder, 4 pages—"Gear Errors Are Costly" discusses incorrect gear teeth, and suggests elimination of gear errors to improve production. Illustrated with plant photographs of actual installations.—SIER-BATH GEAR & PUMP COMPANY, 9252 Hudson Blvd., North Bergen, N. J.

B-23 **INDUSTRIAL HOSE**—Pamphlet, 8 pages—Describes new "Basic-Five," color-coded, multi-purpose industrial hose line of hose, designed to replace 18 hose types offered formerly with 5 types in the new line. Gives details of construction, sizes, length, pressures, recommended couplings, and uses.—THE THERMOID COMPANY, 400 Whitehead Road, Trenton, N. J.

These free catalogs and bulletins on the latest developments in equipment and supplies for better production in the South and Southwest are offered by leading manufacturers.

For your free copy, circle the item number on one of the reader service post cards provided on pages 17-18.

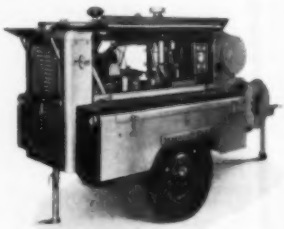
Equipment & Supplies For Better Production

(Starts on Page 8)

Portable Compressors

L-8 INGERSOLL-RAND CO., 11 Broadway, New York 4, N. Y., has added to its line of Gyro-Flo portable compressors three new sizes.

The 315, 210, and 105 cfm units make the advantages of the rotary sliding-vane design available for a wide range of operating requirements.



Ingersoll-Rand's 105 cfm portable compressor of the rotary sliding-vane design. This model weighs only 2650 lb—ready to go.

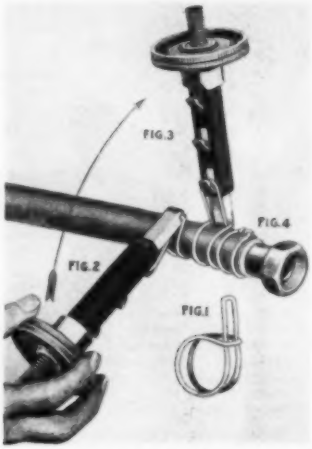
The two-stage, oil-cooled, rotary sliding-vane compressor design of the Gyro-Flo machine eliminates most of the problems of reciprocating units for portable service. There are no valves to leak, no pistons, rings, rods or clutch to wear. Air, discharged at less than 200° under normal operating conditions, together with thorough oil separation, eliminates hose deterioration caused by heat and oil. The continuous rotary action provides a steady flow of air without pulsations or vibrations.

Tool for Hose Connections

L-9 SQUIRE-COGSWELL CO., 4140 North Kedzie Ave., Chicago 18, Ill., has introduced a new type hose connection, comprised of a hose band and hose tool.

No bench or vise is needed to apply the bands, and they may be attached anywhere. Savings in time and labor cost by this method amount to as much as 75 per cent over the old method of applying couplings, according to the manufacturer.

The tools are made in two sizes to fit all size hose: the Junior for bands up to ⅝ in. sizes; the Senior for bands 1 in. size and over. The bands are made of soft steel wire, electro galvanized and welded, and are also available in brass if required. These bands will give a tight, permanent and rust-proof connection; and can be used equally well for air, steam, water or oil hoses.



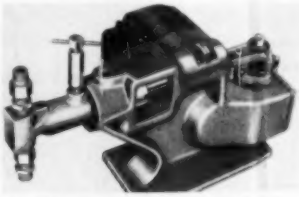
Hose band and hose tool of *Squire-Cogswell* Co. cut hose connection costs.

new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

Chemical Metering Pump

L-10 %PROPORTIONEERS, INC.%, 345 Harris Ave., Providence 1, R. I., has just announced the Model X-52 Adjust-O-Feeder designed to provide accurate feeding of chemical solutions for plants where low capacity and medium pressure will meet requirements.



Chemical metering pump of *%Proportioneers, Inc.%* has an adjustable capacity range of from 1 to 10 gph discharging against pressures up to 650 psig. Feeding range of from 0.5 to 5 gph at same discharge pressure is also available.

The unit is compact and inexpensive having built-in oil-enclosed gear reduction and built-in standard motor eliminating any separate baseplate, gear box or couplings. Since the crank and connecting rod operate in a horizontal plane, the scale for the Micro-Stroke Adjustment is convenient to read. A one-piece Meehanite iron frame, assuring positive alignment of all moving parts together with readily interchangeable measuring cylinders, stainless steel plungers, double ballcheck valves and trim provide for long life and inexpensive maintenance.

Production Method

(*Continued from page* 88)

two of the program. Among the most important of these are:

1. A special procedure for rush orders to expedite their handling, with a minimum disruption of normal production.

2. A complete descriptive outline listing all steps and operations (no matter how trivial) performed on all standard types of metallic and nonmetallic rings and rod packing being manufactured in the plant.

3. A new flow pattern which, along with new and improved machinery, has effected a speed-up in the flow of products through the plant. The new pattern was worked out through relocation of some machines and replacement of others with improved equipment.

Bottlenecks, persistent and potential, in the flow of products have been eliminated. For instance, production engineers determined that at some points in the "old" flow pattern, too much time was used up in the movement of partly-finished products from one machine to another. So the machines were moved closer together. These and other changes in the old pattern made the product stream flow faster.

It was a study of the plant's pre-PPI flow pattern that pointed up the necessity for new and improved machines, including those discussed above, machines which would speed and smooth product flow.

Achievements in the PPI program have been even more valuable than anticipated, Double Seal officials report. Originally intended to be completed in 18 months, the program probably will be continued indefinitely, they have agreed, to effect additional improvements.

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Time study engineer. Must be capable of supervising plant of two hundred employees manufacturing hypodermic syringes and hypodermic needles, preferably college graduate with engineering degree. Write Box 195, c/o SOUTHERN POWER & INDUSTRY, 806 Peachtree St., N. E. Atlanta 5, Ga.

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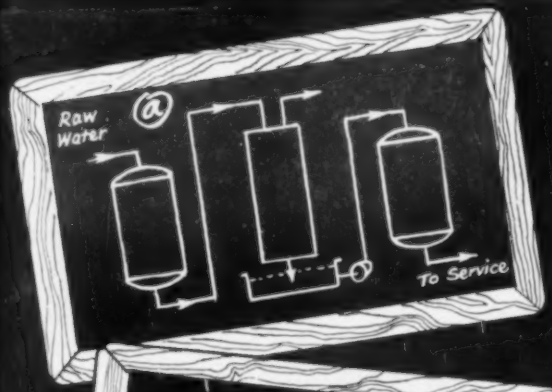
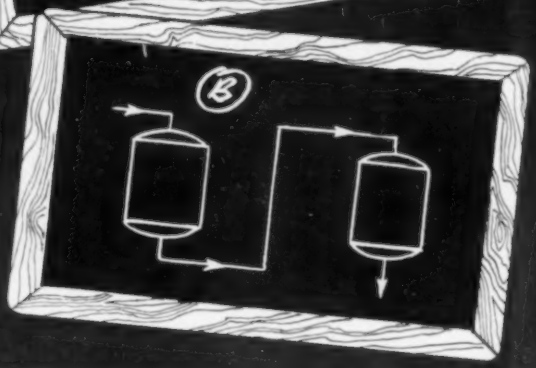
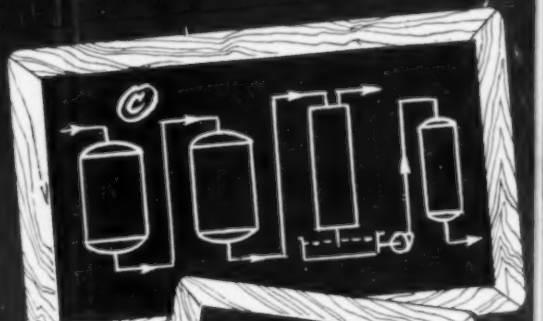
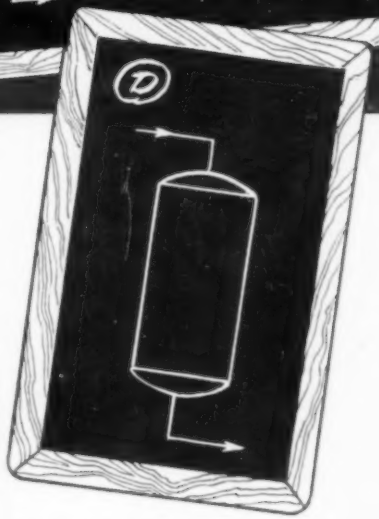
The ABC's of Better Boiler Feedwater









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